

Faculty and Student Teams and National Laboratories



Expanding the Reach of
Research Opportunities and
Workforce Development

FaST At a Glance

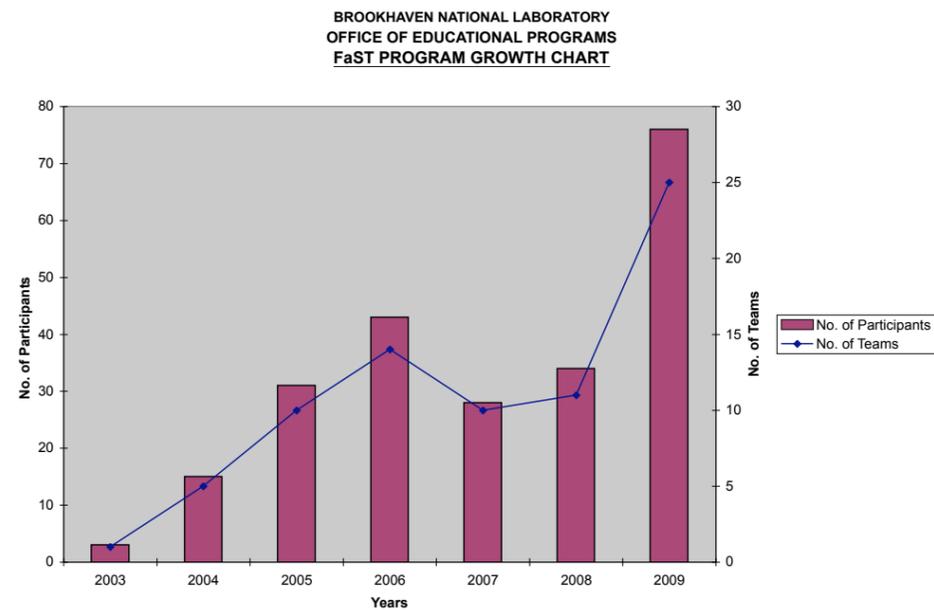
Since the inception of the **Faculty and Student Team (FaST) program** in 2003 at BNL, the Office of Educational Programs (OEP) has hosted 76 teams from 34 colleges/universities. The following are some data on the program:

- 18 professors are multiple repeaters in the program
- From the participating schools 24 were Minority Serving Institutions (MSI)
- To date a total of 82 proposals were submitted and 37 grants were awarded with 19 pending.
- A total value of \$58, 892,400 in proposals were submitted and \$34,753,900 were awarded in grants.

In 2009 BNL hosted a total of 25 professors in the FaST program, 14 new professors and 11 returning professors from 12 HBCUs, 6 other MSIs and 7 other institutions.

Since 2003 the FaST program has grown from 1 team (3 participants) in 2003 to 25 teams (76 participants) in 2009. The following is a Growth Curve showing the progress during this period:

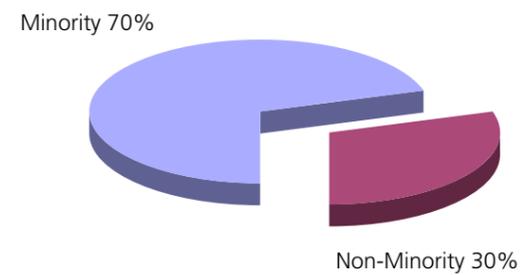
Growth Curve:



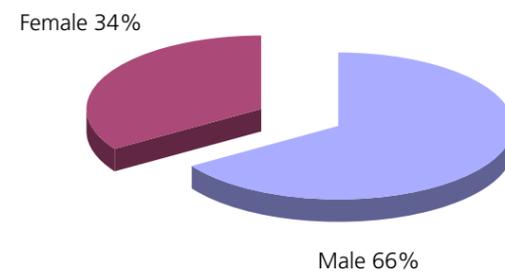
Participation:

The program has hosted 203 participants to date. The following is a breakdown of the minority and gender participation:

Diversity Graph:



Gender Graph:



FaST and National Laboratories

Expanding the Reach of Research Opportunities and Workforce Development

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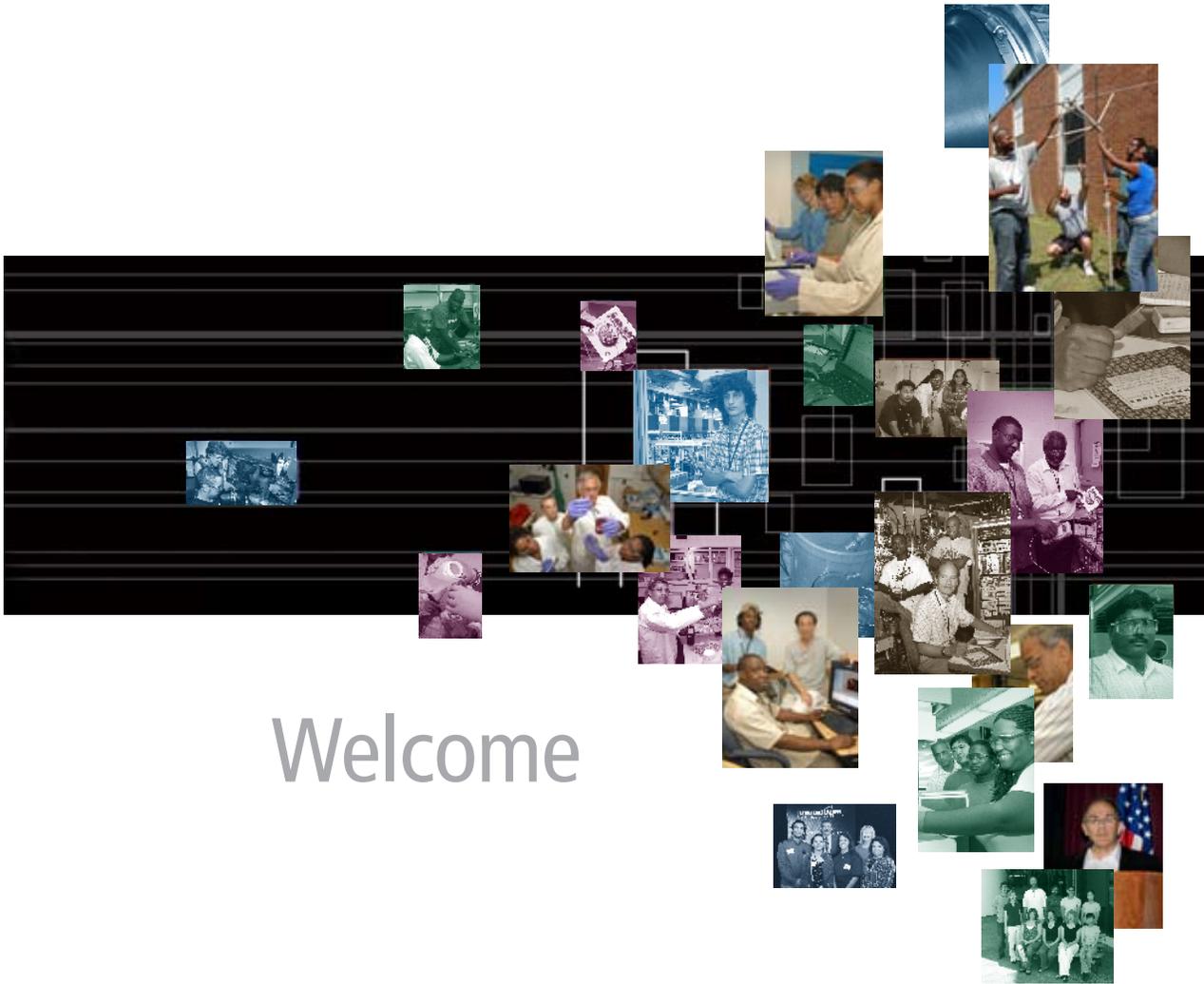
BNL-82384-2009

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Welcome

A Message From The Director

The Department of Energy's (DOE) national laboratory system provides a unique set of research tools for use by researchers from across the globe. Access to the advanced capabilities of these tools provides scientists from our universities and colleges an opportunity to conduct research and to make discoveries that they simply otherwise could not achieve. The machines, equipment, and detectors housed at Brookhaven National Laboratory – including the National Synchrotron Light Source, the Relativistic Heavy Ion Collider, and the Center for Functional Nanomaterials – are examples of world-class resources DOE provides to researchers. Training our nation's researchers to use these tools and building scientific user communities for them are important parts of our mission. It is also important to the Lab, DOE, and me that our user communities and our facility staff be diverse. The DOE Faculty and Student Teams (FaST) Program is one that I particularly value because it advances these priorities for the Lab.

The DOE FaST Program, run in partnership with the National Science Foundation, has proven to be an effective vehicle to work with communities underrepresented in the sciences, such as faculty and students from Historically Black Colleges and Universities and other Minority Serving Institutions. The FaST Program has enabled Brookhaven to build relationships with talented faculty researchers from these institutions, to familiarize them with and to train them in the use of DOE research tools, and to build collaborations with our scientific staff. This introduction to our research resources has helped us to build and diversify our user base, which is particularly important as we begin construction of our newest machine, the National Synchrotron Light Source II. The faculty members also bring undergraduate students, provide mentoring, and work as collaborators with our scientists, contributing to the Laboratory's research goals. It is also rewarding to see that the faculty members have been able to leverage their relationships with our research staff and their use of DOE research capabilities to increase the competitiveness of their grant submissions.

I appreciate the foresight of the DOE Office of Science's Office of Workforce Development for Teachers and Scientists to develop and continue to support this program, as it has provided substantial benefits for DOE as well as the participating faculty, students, and their home institutions. The outcomes outlined in this report are Brookhaven's, but they exemplify the results of the program across the DOE complex.

Sincerely,

A handwritten signature in black ink, appearing to read "Sam Aronson", written in a cursive style.

Samuel Aronson

Director, Brookhaven National Laboratory

Faculty and Student Teams: Building National Research Capacity at National Laboratories

No matter what business you are in, successful and productive partnerships demand time, energy, enthusiasm and mutual benefit for those involved. If partnerships are to become durable, they must bring consistent and long-standing value to each party. The U.S. Department of Energy's (DOE) Faculty and Student Team (FaST) program funded by their Office of Workforce Development for Teachers and Scientists, has allowed Brookhaven National Laboratory to establish a foundation from which to launch valuable, sustained partnerships between academic institutions and its research staff. An important factor in this program has been the partnership of the National Science Foundation (NSF) through a Memorandum of Agreement with DOE – NSF support to participating universities has enabled Brookhaven to host many additional teams, particularly those from Historically Black Colleges and Universities and Minority Serving Institutions.

Understanding the importance of programs such as the FaST program is really quite simple. Our national security, economic prosperity, environmental conditions, health and well-being are deeply rooted in our scientific and technological capacity. DOE national laboratories, operating many of the world's best research facilities, provide the setting where some of the most progressive basic and applied research takes place. Changing demographics, a need for domestic scientists and the advancement of other nations in science and technology mean that we need to tap into resources that are available, yet underutilized in the sciences - our underrepresented minority population and our rural communities. The FaST program establishes the conditions necessary to make advances in connecting national laboratory resources with these communities to our common advantage. The partnerships that have developed involve BNL researchers and university faculty in a way that:

- aligns their research interests to create productive, mutually beneficial collaborations
- focuses on problems of national concern
- introduces faculty researchers to national research tools
- increases faculty competitiveness for grant submissions
- influences academic programming
- introduces students to national research tools and settings through cutting-edge research

This report documents the outcomes of the DOE FaST program at BNL which serves as an example for the DOE complex-wide FaST program. The contents provide evidence that it is truly a foundational program that facilitates durable and sustainable impacts of value to the academic institutions whose faculty participate, the Laboratory researchers who build a research team to tackle challenging problems for DOE, builds capacity at participating institutions, and encourages U.S. students to pursue careers in science, technology, engineering and mathematics.



Kenneth White
Manager, Office of Educational Programs
Brookhaven National Laboratory

A Note From The Program Manager

The Faculty and Student Teams (FaST) Program is a win-win program. You may ask what I mean by that.

The program attracts talented professors who may not be recognized for their work or may not be exposed to national laboratories and their major research tools. Conversely, the scientific community at national laboratories may not have the opportunity to interact with these talented professors since their schools may not be in the top 300 tertiary institutions that the Department of Energy (DOE) normally works with.

What happens when talented professors and the scientific community at national laboratories meet each other?

This report highlights how the FaST experiences at Brookhaven National Laboratory (BNL) successfully fulfill the outcomes expected of this program.

For example, the Interdisciplinary Consortium for Research and Educational Access in Science and Engineering (INCREASE), formed as a result of the FaST program, encourages and facilitates professors from Minority Serving Institutions to become users at BNL's National Synchrotron Light Source (NSLS). This new community at the NSLS will increase the user population and create further collaborative possibilities for all. What is very exciting about this consortium is the potential for it to expand its scope at BNL with the use of the Laboratory's other major facilities and, also, scale up to the entire DOE complex.

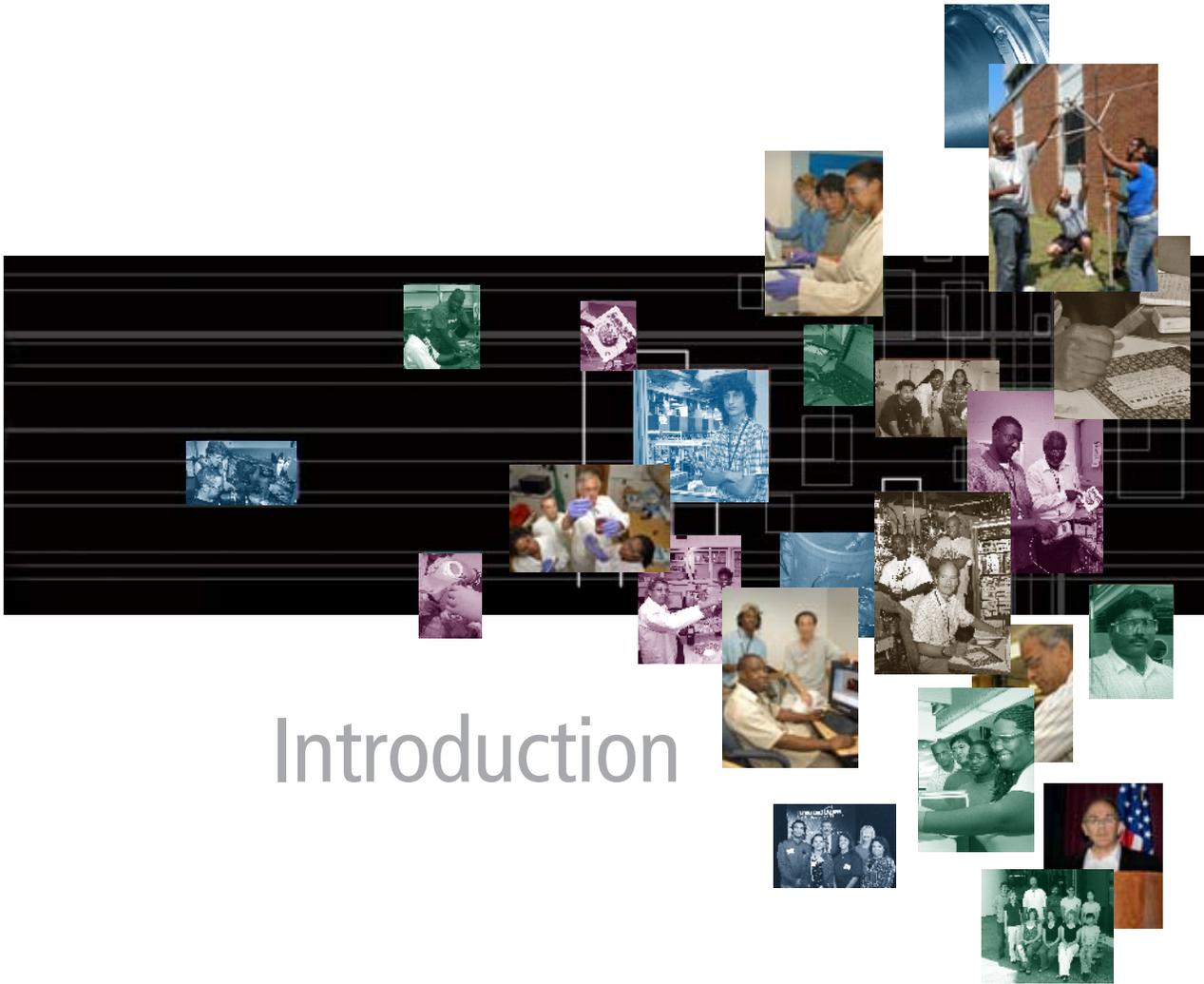
Gaining access to research tools and expanding research opportunities is becoming the trend for talented faculty at teaching institutions throughout the nation. These institutions are changing their way of business to keep up with their faculty's desire for growth, and the FaST program is one way to start capitalizing on the momentum that is already building within their institutions.

In the following pages, you will read articles that demonstrate how the FaST program successfully advances the national interest in sustaining our leadership in scientific research.

I am very excited and passionate about the FaST program. I welcome the scientific community at BNL and the DOE complex at large to take advantage of this endeavor to explore the program's possibilities. No one knows where the next Nobel Laureate will come from or who he or she might be.

A handwritten signature in black ink, appearing to read "N Blackburn", is written over a horizontal line. A small black dot is placed at the end of the line to the right of the signature.

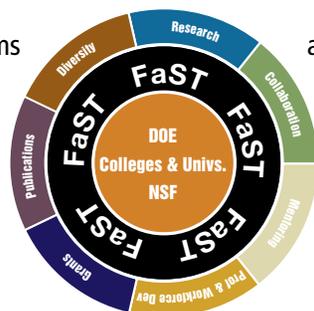
Noel Blackburn
Educational Programs Administrator
Brookhaven National Laboratory



Introduction

Introducing the Department of Energy Faculty and Student Teams Program

The Faculty and Student Teams (FaST) Program, a cooperative effort between the US Department of Energy (DOE) Office of Science and the National Science Foundation (NSF), brings together collaborative research teams composed of a researcher at Brookhaven National Laboratory, and a faculty member with two or three undergraduate students from a college or university. Begun by the Department of Energy in 2000 with the primary goal of building research capacity at a faculty member's home institution, the FaST Program focuses its recruiting efforts on faculty from colleges and universities with limited research facilities



The above diagram is a schematic showing two federal agencies in DOE and NSF teaming with academia to facilitate the FaST program. On the outer ring are the outcomes of the FaST programs which every participant is expected to fulfill.

and those institutions that serve populations under-represented in the fields of science, engineering and technology, particularly women and minorities. Once assembled, a FaST team spends a summer engaged in hands-on research working alongside a laboratory scientist. This intensely collaborative environment fosters sustainable relationships between the faculty members and BNL that allow faculty members and their BNL colleagues to submit joint proposals to federal agencies, publish papers in peer-reviewed journals, reform local curriculum, and develop new or expand existing research labs at their home institutions.

Distinguishing Characteristics of FaST

The DOE Office of Science (SC) currently supports research at 300 universities, most of which are above the 50th percentile in receipt of Federal funding. The FaST Program is designed to reach out to faculty and students from universities, colleges, and community colleges that have not done business with SC and provide them with the tools, knowledge, and resources needed to compete for future research funding. Introducing these faculty members to DOE research and facilities assists in building capacity at schools that are often minority serving institutions such as rural colleges, Historically Black Colleges and Universities, Hispanic Serving Institutions, and Tribal Colleges. With its emphasis on the science, technology, engineering, and mathematics (STEM) disciplines, the FaST Program not only serves as a platform for the recruitment of future scientists and technicians, it also brings under-represented populations into the DOE research system. Introducing these populations to the DOE national assets for research and sustaining their participation is a primary goal of the program.

Because FaST students may attend two or four-year institutions, this program is integrated with both the Community College Institute of Science and Technology (CCI) and Science Undergraduate Laboratory Internships (SULI) undergraduate research programs. In addition, by developing new and trusted partnerships with non-traditional institutions and participants, FaST sup-

ports the outreach efforts of the DOE Workforce Development for Teachers and Scientists (WDTS). Finally, FaST, through its strong relationship with the National Science Foundation (NSF), opens the door to partnership opportunities with other Federal agencies and expanded NSF collaboration.

At the participant level, faculty and students become familiar with SC research and business operations and have the opportunity to expand their participation in WDTS and SC programs through access to the major scientific research tools available only at a national laboratory. At the national laboratory level, research scientists have been able to leverage the experience and expertise of a faculty member with undergraduate research interns and establish reciprocally beneficial durable relationships for expanding their own research and competing for research funding. At the program level, under-represented institutions are working toward increasing their capacity to compete for WDTS and SC resources. Finally, at the enterprise level, DOE and other federal funding agencies will be able to draw employees from a larger and more diversified pool of highly skilled workers. Tapping into this talent pool for both employees and facility users is already happening at BNL.

The Brookhaven National Laboratory Environment

Brookhaven National Laboratory (BNL), home to the work of six Nobel Prize winners and one of ten national laboratories overseen



and primarily funded by the Office of Science of the U.S. Department of Energy (DOE), conducts multi-disciplinary research in the physical, biomedical, and environmental sciences, as well as in energy technologies and national security. Brookhaven Lab also builds and operates major scientific facilities available to university, industry, and government researchers. Examples include the National Synchrotron Light Source (NSLS), the Relativistic Heavy Ion Collider (RHIC), the Alternating Gradient Synchrotron (AGS), the Center for Functional Nanomaterials (CFN), a facility for Positron Emission Tomography (PET) and Magnetic Resonance Imaging (MRI), the Laser-Electron Accelerator Facility (LEAF), and a Scanning Transmission Electron Microscope. These facilities and the supporting laboratories are staffed by world-class researchers, both as BNL and DOE employees and as visiting scientists, who are all highly supportive of the BNL science education and workforce development mission.

In addition to its facilities and staff resources, BNL is located on a 5,300-acre site with great biodiversity and a natural resource management group that is intimately involved in research activities and educational initiatives. The other supporting infrastructure at BNL includes dormitories, housing, a cafeteria and after-hours restaurant, a credit union, post office, gymnasium, rental car facility, and many other quality-of-life facilities and functions for visiting FaST participants.

The rich research environment and an experienced staff within

the BNL Office of Educational Programs (OEP), the organization that manages the DOE FaST program, complements physical resources at BNL. The OEP staff includes experienced science educators who manage and operate science education programs at every level from kindergarten through graduate school. Over 40,000 students, teachers, and university faculty participated in BNL science education programs this past year. Many of the science education programs have been in place for several decades and have served as models for some of the current DOE Office of Workforce Development for Teachers and Scientists programs. The OEP staff continues to work collaboratively with BNL scientists and researchers to implement the FaST program by creating opportunities for FaST teams to meet with other BNL researchers, faculty teams, and other summer interns including students in the Community College Institute (CCI), Science Undergraduate Laboratory Internship (SULI), and Pre-Service Teachers (PST) programs. During their stay, these experiences are further enhanced by weekly lectures by resident scientists on their own current research projects as well as a weekly lunchtime meeting for all of the FaST team faculty members where they each report on their research and how the BNL experience is furthering it.

The Brookhaven National Laboratory Research Environment

Once a FaST team arrives at BNL, it quickly finds itself immersed in the highly interactive and stimulating experiences of the day-to-

day activities of a research laboratory. FaST program participants work at the National Synchrotron Light Source (NSLS) as one of the more than two thousand researchers who conduct research at the NSLS each year or at the Laser-Electron Accelerator Facility (LEAF), the preeminent pulse radiolysis facility in the country, and other BNL facilities such as RHIC, PET, and CFN. While at BNL, FaST faculty members use these tools, not normally available to them at their home institutions, to start, restart or kick-start their own research, or to develop new avenues of inquiry to explore at BNL and, subsequently, at their own schools. The student members of a FaST team also benefit since they too become immersed in the research culture of a national laboratory and further develop their own research skills in a richly supportive environment that underscores the benefits of collaboration. The tutelage of a faculty member also adds value to mentoring activities during the academic year. Participating in active research and having good mentorship relations are known to promote student persistence in the sciences. [1]–[8]

The BNL researcher also benefits from the collaboration of FaST teams with a dedicated team of scientists who are working to advance their own research and development objectives. Further, the expertise, insights, and experiences of a faculty colleague also contribute to a supportive environment that reinforces student learning through research participation. The researcher can turn over aspects of the research to the faculty member and students confident that the faculty member, because of his or her awareness of the students' talents and expertise, will more effectively and efficiently train and supervise the work of the student interns. This close collaboration also provides the faculty member with student researchers who have had the benefit of working in a national laboratory setting and can thus contribute these skills to the faculty member's own research when they return to their own institution.

In addition to collaborative research and the chance for publications that might grow out of this work, faculty members, energized by their time at BNL, often use this experience as a catalyst for curriculum reform by revising current coursework or developing new courses. In particular, faculty return to their home institutions inspired to enlarge or, more importantly, establish their own research facilities and programs.

The faculty profiles that follow amply demonstrate that pulling together research teams from around the country offers an avenue for improving the research capacity at institutions with limited facilities, providing faculty with the opportunity to further their own research talents, and developing the next generation of scientists, engineers, and technicians.

The profiles also demonstrate the positive impact of FaST on grant writing success, the development of curriculum reform, and the professional growth of FaST faculty and students.

With research facilities such as the National Synchrotron Light Source, the Relativistic Heavy Ion Collider, the Alternating Gradient Synchrotron, the Center for Functional Nanomaterials, the Laser-Electron Accelerator Facility as well as a facility for Positron Emission Tomography and Magnetic Resonance Imaging, BNL offers FaST teams unique opportunities unavailable to them elsewhere with support from researchers who value the chance to collaborate with colleagues and assist in mentoring their students. The BNL FaST Program provides a rich and exciting environment for research, learning, workforce development and long-term collaboration, all focused on some of the most important scientific and technical challenges facing our nation and the world.

List of Works Consulted

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Outcome Highlights

FaST Goals

Department of Energy

- Advance the DOE scientific mission.
- Seek new users for national laboratory facilities.
- Build research capacity at HBCUs and MSIs.
- Expand faculty and student participation in WDTS and Office of Science
- Provide opportunities for faculty and students to become familiar with Office of Science research and business operations.
- Introduce students to the various employment opportunities within the DOE workforce family.

National Science Foundation

- Develop research and education capacity.
- Develop a scientifically literate public.
- Facilitate partnerships, both nationally and internationally.
- Seek and accommodate contributions from all sources.
- Provide opportunities for faculty and students to participate in interagency research.

College or University

- Create opportunities for continuing research.
- Provide for professional development of faculty
- Foster collaborations with world-class scientists in other institutions.
- Enable faculty to access the world-class research machines of national laboratories.
- Develop research opportunities for undergraduate students
- Increase competitiveness in grant writing through collaborations with national laboratories.
- Leverage a collaborative association with a national laboratory to develop a science program that attracts talented students.
- Transform teaching.

Shared Goals

- Cultivate the world-class science and engineering workforce needed in a global knowledge economy.
- Integrate research with education by developing unique networks and innovative partnerships.
- Motivate students to pursue advanced and terminal degrees.
- Ensure that STEM education and work force preparation are broadly available.
- Expand participation in STEM fields from underrepresented groups and diverse institutions.



FaST Outcomes

1

Research

Engaged in research using some of the world's best tools for advanced scientific inquiry. The FaST research experience has driven curriculum changes.

The FaST experience has led to increased institutional administrative support for research endeavors.

2

Collaboration

Established ongoing, collaborative relationships between faculty member and staff scientists at National Laboratory facilities.

Brought in a new population of researchers.

Established new and trusted partnerships with underrepresented groups and diverse institutions from HBCUs and MSIs.

At BNL FaST is integrated with both the Community College Institute of Science and Technology (CCI) and Science Undergraduate Laboratory Internships (SULI) undergraduate research programs.

3

Mentoring

Established mentoring relationships based on a research participation environment.

Senior research scientists provided mentoring during the grant application process for faculty members.

The student members of a FaST team became immersed in a richly supportive mentoring environment.

4

Professional and Workforce Development

FaST faculty members used the tools not normally available to them at their home institutions to start, restart, or kick-start their own research or develop new avenues of inquiry to explore further at their own schools.

The student members of a FaST team also developed their own research skills that may motivate them to pursue advanced and terminal degrees in science.

Faculty members have been encouraged by their FaST experience to enlarge or, more importantly, to establish their own research facilities and programs.

5

Grants

The FaST Program provided faculty members with the tools, knowledge, and resources needed to compete for future research funding.

6

Publications

Many of the FaST Program's faculty members have published their work.

7

Diversity

The FaST Program has brought under-represented populations into the DOE Office of Science research system.



From Incubation to Maturity via the Department of Energy's Faculty and Student Teams Program

By Dr. Reggie Blake

In the summer of 2004, a year after I became a full-time, tenure-tracked member of the Physics Department of the New York City College of Technology (City Tech) of the City University of New York, I was afforded the opportunity of becoming a member of the Department of Energy's Faculty and Student Teams Program (FaST) hosted by the Office of Educational Programs at the Brookhaven National Laboratory (BNL). Little did I know just how much of a career building stepping stone this opportunity would become.

As members of the FaST team in 2004, two of my City Tech students and I conducted research on "Mercury Deposition from Coal-Fired Power Plants" with BNL scientist Dr. Terry Sullivan. Not only were we able to conduct plume dispersion modeling experiments at BNL, we also traveled to Springfield, Illinois to collect soil and vegetation samples from regions in close proximity to two major coal-fired power plants. The research trip was novel and very exciting for both my students and me. We were afforded real, hands-on training and research experience. This research project culminated in one of my first peer-reviewed journal publications as a junior faculty. [1]

I returned to the FaST program in the summer of 2005. This time I brought along three other City Tech students with me, and we conducted research on "Temperature Measurements and Temperature Sensors" with BNL scientist Dr. Michael Reynolds. At that time, Dr. Reynolds was a lead scientist with the Urban Dispersion Program (UDP), a program administered by the Department of Homeland Security, the National Oceanic and Atmospheric Administration (NOAA), BNL, and New York City's Office of Emergency Management. The UDP had just designed a project to examine the dispersion of airborne materials within the deep street canyons, into modern office buildings, and through the subway system of New York City. The project was executed by controlling the release of non-toxic "tracer" gases into the environment around mid-Manhattan and then monitoring their dispersion using a total of 158 integrating tracer samplers and 9 fast-response tracer analyzers deployed at street-level. The UDP conducted two field campaigns that involved more than 25 organizations and over 250 people. Approximately 30% of the participants were students from universities and colleges around NYC. I participated in both

field campaigns as the key research person in charge of student tracer deployments and measurements. One practical extension of the UDP research effort in NYC was the decision to establish a permanent meteorological network in NYC (NYC MetNet) based on the equipment used in these two field studies and the addition of a radar wind profiler to provide a routine profile of winds up to 2.5 km/h. The NYC MetNet has now been expanded and is under the control of NOAA-CREST, NOAA's premier satellite and ground-based, remote sensing center headquartered at the City College of New York. I have been an active member of NOAA – CREST from its very inception in 2001, and I am an active member of its NYC MetNet group.

As a Principal Investigator, Senior Personnel, or Advisor, I have been involved with grants that have garnered over \$14,725,412, and I am currently involved with pending grants (as PI, co-PI, Senior Personnel, or Advisor) that amount to \$26,066,616.

Not only have I been successful with grant writing, but the FaST program has also helped me to become a leader in academia and research. I currently lead City Tech's Project Kaleidoscope's Inter-Disciplinary project, and I am the project director of my institution's Black Male Initiative program, a project that has been nationally recognized as a Model Replication Institution program for the STEM disciplines. Additionally, in the summer of 2008, I was selected by Mayor Michael Bloomberg to join New York City's expert panel on Climate Change.

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As a direct result of the BNL Urban Dispersion Program I was part of during the Summer 2005 FaST program, I have introduced elements of plume dispersion modeling in an urban setting in one of my physics courses.

—Reginald Blake, New York – New York City College of Technology

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My career both as a professor of physics and as a research scientist has benefited from my involvement in the FaST program. The professional contacts I have established, along with the many collaborative efforts, the continued support of the Office of Educational Programs at BNL, the exposure and the experiences I have encountered have all converged to mold and to shape my career positively. My involvement with the FaST program and the exposure gained from the two summer activities with my City Tech students were instrumental in my becoming a tenured professor in September 2008. Further, I am now being considered for promotion to associate professor.

This panel of scientific experts has been charged with the responsibility of providing the climate change science that will underpin New York City's climate change policy for decades to come.

It is, therefore, in no small part that I express my gratitude to the FaST program for planting the seeds of success for my academic career. I am also deeply indebted to the BNL Office of Educational Programs and, particularly, Mr. Noel Blackburn for recruiting and nurturing me. Mr. Blackburn has played a critical role in my development as a scholar, and I must offer my sincere and profound thanks to him. My collaboration with the FaST Program is by no means over. I expect to continue and to strengthen my ties to it. While there is much work still to be done and greater heights to attain, whatever further success I may achieve in my academic pursuits can all be traced back to my involvement with the Department of Energy's

The FaST program gave me the confidence and the poise to embrace all aspects of the professoriate and all types of research endeavors. It was through the FaST program that I was first introduced to grant writing, particularly the writing of grants to the National Science Foundation (NSF). The NSF video conference sessions that I attended as a member of the FaST program gave me the assurance and the skills necessary to write strong proposals. Today, thanks in part to the FaST program, I have developed into a prolific grant writer. In the last four years, as Principal Investigator, co-Prin-

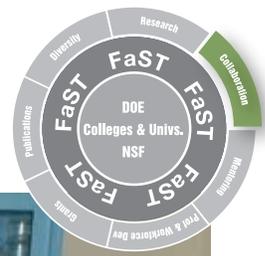
FaST program sponsored by the Office of Educational Programs at Brookhaven National Laboratory.

[1] Sullivan, Terry M., Jay Adams, and Reginald Blake. 2006. Urban impacts of mercury emissions from coal-fired power plants. *Journal of Urban Technology* 13, no.2: 53–70.

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86%
*of the FaST professors
 plan to increase their
 research opportunities*

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New Orleans FaST team joins with BNL and Dowling College professor to profile the Long Island Pine Barrens

By Kristen Dorans (2008 BNL SULI science writing intern)

Adapted from *The Bulletin*, vol. 62, no. 27, August, 2008.

When Murty Kambhampati of Southern University of New Orleans (SUNO) arrived at BNL along with two SUNO undergraduate students, Jeffrey Ambrose and Nyesha Smith, as the 2008 FaST team from SUNO, they joined up with Vishal Shah, a Dowling College professor, to map the community-level physiological microbial profile of the Long Island Pine Barrens. The research, the first-ever project of this type in the world, is supported by DOE's Office of Workforce Development for Teachers and Scientists through its Faculty and Student Teams Program (FaST), the National Science Foundation's Historically Black Colleges and Universities Undergraduate Program (HBCU-UP), and the U.S. Department of Education's Minority Science & Engineering Improvement Program (MSEIP). Tim Green, who manages BNL's natural and cultural resources, and Noel Blackburn, an educational programs administrator at BNL's Office of Educational Programs (OEP), facilitated this collaboration at BNL.

In addition to contributing new findings to the field of microbiology, the research brought together BNL scientists, faculty from Dowling College, a small liberal arts school in New York, and

students and faculty from SUNO, an HBCU school.

"The collaboration provides research opportunities not only for the professors, but for the students as well," Green said. "It is important that we develop researchers from schools where they otherwise might not have had a chance to do research."

Dowling's Vishal Shah has been collaborating with Green on the project for the past two years. This past year Kambhampati's FaST team joined Green and Shah to collaborate on this Pine Barrens mapping project.

"My goal as a faculty member is to motivate under-represented students by exposing them to state-of-the-art science and technology in the field of environmental science," Kambhampati said. "That's why we formed this collaboration. Our team has had a great experience working with Dr. Shah. He is an enthusiastic mentor and an excellent team player."

While at BNL, the FaST team went out in the field to take soil samples throughout the Pine Barrens from strategically mapped, permanent, forest health spots established by the Foundation for Ecological Research in the Northeast (FERN). They took soil layers



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As a result of their BNL FaST experience, the students who were on my team are more focused, self-confident, and motivated to attend graduate and/or professional schools as they pursue their career choices.

*– Murty Kambhampati,
Louisiana – Southern
University at New Orleans*

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from three different levels and brought them back to Dowling for analysis. This project, which will provide more information about the health of the Pine Barrens, might also lead to the discovery of new microbes with potential medicinal properties, Kambhampati explained.

“We took the challenge and so far the research has been successful,” he said. “We look forward to making it a more meaningful project both scientifically and educationally.”

Shah noted that this collaboration gives students confidence. “Even if you are in high school or an undergrad, if you believe in yourself, you can do wonders,” he said.

Ambrose and Smith, both of whom plan on pursuing combined M.D./Ph.D. degrees after completing their undergraduate degrees in biology, have benefited from their first research experience.

“Jeff and Nyasha have great potential and talent,” Shah said. “By getting this research exposure and working with professors like Dr. Kambhampati, I am sure that they will succeed in their future careers.”

“It has been a fulfilling experience,” Ambrose said. “It’s a lot of hard work, but we’re up to the challenge.”

Smith added that this summer helped solidify her future. “It has made me love research even more,” she said. “Now I know what to expect in this field.”

As a result of his mentoring activities at SUNO, Kambhampati received the 2008 Minority Access, Inc., National Faculty Role Model Award. Additionally, Carmen Maldonado, one of his students and a BNL 2008 SULI Intern, also received a Minority Access, Inc., National Student Role Model Award for her excellence in academics and research. This was a first in the history of SUNO. Dr. Kambhampati has also assisted his students in publishing papers in peer-reviewed, refereed journals and research abstracts in local, regional, national and international conference proceedings. These students have presented in more than twenty conferences across the United States over the past three years, and some have won awards for their excellence in poster and oral presentations.

The first annual Science and Energy Research Challenge (SERCh), sponsored by the Department of Energy’s (DOE) Office of Science, was held on November 9-10, 2008, at Oak Ridge National Laboratory. Eighty-five undergraduate students, twelve of whom completed a 2008 summer internship at BNL, were selected to participate in this prestigious and highly competitive National poster competition. Of those selected from BNL, five were Kambhampati’s SULI students. They included Jeffrey Ambrose and Nyasha Smith from the 2008 FaST Pine Barrens project as well as Ha’Wanna St. Cyr, Carmen Maldonado and Tyra Bunch.



Scientific Grandchildren: A Mentor's Story

By Myron Strongin (Brookhaven National Laboratory)

Adapted from US Department of Energy Journal of Undergraduate Research, vol. VI, 2008.

Many things have been said about the value of mentoring, and in some sense not much can be added. A mentor is someone who is interested in the first steps of developing a student into a professional. There are many lessons that must be taught. For example, "Don't listen to orthodox explanations." Well, maybe listening is okay, but believing all you hear isn't okay. "Find the courage to stick to your conclusions." "Don't get discouraged when mistakes are made." "Understand what you are doing, and if things don't work you must evaluate what you did and make sure it's correct." The list goes on and on, and in some sense a mentor must get the student through these obstacles.

In fact they are not obstacles, but really become a mind set for a scientist. Even though I could probably find more things to enumerate, I must emphasize that the most important thing to leave with a student is the sense of adventure in science, to try something no one has ever tried, and ultimately if your experiment or calculation goes well, to realize that you know more about something than anyone else in the world.

There was a very amazing surprise that happened a couple

of summers ago. Noel Blackburn in our Office of Educational Programs indicated that he had a candidate in the Faculty and Student Team (FaST) program that might be a match for me, and was I interested. After looking at the credentials of Abebe Kebede of North Carolina A&T, he seemed to have experience in my area and I had a good project for him and his students. What's interesting is that in looking at his credentials he had reasonable publications, and better yet he got his Ph.D. with Jack Crow at Temple University. Jack Crow was a remarkable scientist with the vision to create the National High Magnetic Field Laboratory in Tallahassee Florida. Tragically, Jack died in September of 2004 from pancreatic cancer. The memorial service information says that "The National High Magnetic Field Laboratory is truly the house that Jack built." It couldn't be put better.

So in the summer of 2004, Abebe Kebede, his students, and I agonized over Jack, as well as measuring the conductivity of percolating gold clusters. Interestingly, I had hired Jack when he left graduate school; we worked together for many years before he went to Temple. So, in some sense, Abebe, Jack's student, is really



The students were able to participate in the doing of science. This is important for any future scientist or science teacher. The students realized that in science you do not always know the “right” answer and that it requires long hours, hard work, and persistence.

– Rita Hagevik, Knoxville, Tennessee – The University of Tennessee

my scientific “grandson,” which of course makes me a great-grandfather to Chris Jes-samy and Tanina Bradley, the students who accompanied Abebe from North Carolina. Having a part in this as a mentor has been a great source of satisfaction for me as I see the excitement of science passed on to new generations.

There is another interesting aspect to this story, and that is the value of the FaST program where minority students can take part in some of the things that go on at a great laboratory. They can see ideas flying

71%
of the FaST professors
plan to increase their
research opportunities
for others

around, some good and some bad, and they get the feeling of how science is done and whether this is what they want as a career. It’s important to them, and it’s important to America. In looking through the Web, I noticed that Chris and Tanina expanded some of the work they did here and presented it in the University of North Carolina Student Research Program. I gather that Tanina is finishing up at the University of North Carolina at

Charlotte and Chris is about to graduate from North Carolina A&T. I like to think that somehow we all came together through Jack.



It Goes by FaST!

by Onarae Rice, Furman University

Some people are born knowing what they will become. Others succumb to parental influence and pursue medicine or law. Then there are those that like a flowing stream do not know where the next bend will take them, but they flow, purposefully, nonetheless. I am the latter. I didn't always know what I wanted to do with my life. I had so many interests and surely science was one of them. Fortunately, educational programs were, and still are, available to shape the direction of the youth in this country.

As a junior at Wofford College in Spartanburg South Carolina, I really enjoyed science. I worked as a research assistant in the Dr. Scott's lab and from the moment I created my first graph, I was hooked. I still did not know which area of research I wanted to focus my efforts, but it was clear to me that I loved it and that I needed further direction. Dr. Scott encouraged me to apply to the Science and Engineering Research Semester (SERS) program at Brookhaven National Laboratory (BNL). SERS proved to be the singular, career-defining moment in my life. It cemented my love for science and made the career more tangible and, ultimately, more attainable. Not only did it do this for my career, it shaped my personally – I saw the world differently.

I arrived at BNL for the first time in 1995 during the second semester of my junior year. I'd never been north of the Mason-Dixon Line and I'd certainly never worked at a place with such esteem. My first project was in the Medical Department with Dr. Seichii Yasumura where we worked in conjunction with St. Luke's–Roosevelt Hospital in Manhattan to measure total body elemental composition in order to track the deterioration of muscle and other features in HIV-positive and obese patients. Although this project involved medical physics, something I then knew nothing about, it allowed me to learn a great deal and reaffirmed to me why people dedicate their lives to science: to help others.

After completing the semester internship, I reapplied for the summer version of SERS and was accepted to work further on the same project. I felt compelled to finish, or at least, to continue what I had started. By then, I was tremendously invested in the science and the lives we were helping. My knowledge of medical physics grew. I became more confident, and I was introduced to many other research projects at BNL. The summer proved to be another great experience since I was entrusted with more responsibility. I was even invited to



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79%
of the FaST professors
plan to increase their
ongoing collaboration
with BNL scientists

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attend an international conference.

After graduation from Wofford College, I had not planned to enter graduate school immediately because my mother was undergoing treatment for breast cancer. Nonetheless, I was asked to join the medical physics group at BNL as a Research Associate, and I accepted. There I was encouraged to look into a graduate program that fit my interest in case it was not medical physics. Within the ten years I spent at BNL (1996 – 2006), I worked as a Research Associate, obtained both a Master's Degree and PhD in Biopsychology at Stony Brook University, completed a Post-Doc on a NASA funded project, and made life-long friends at BNL.

Now, as a faculty member at Furman University in South Carolina, I'm participating in yet another Department of Energy (DOE) program, the Faculty and Student Team (FaST) Program, one that affords university professors, along with a team of students, the opportunity to collaborate on research projects with scientists at a national laboratory like BNL. As a young faculty member like me, the FaST research

experience is extremely valuable. Conducting top-notch research and obtaining funding are essential to my professional growth and development. BNL provides instant validation for both and makes these objectives more likely.

Through FaST, my students have the opportunity to discover their own passion. I

have seen them fall more in love with science each day that they spend working in BNL's collaborative research environment. Filled with pride, I've have watched them grow before my eyes.

I'm sure there are many stories like mine. FaST and programs like it are essential to the growth and stability of America's firm place in science and engineering. They help to steer bright and diverse minds while instilling a sense of purpose. I'm forever indebted to DOE and BNL for its commitment to educational programs as they directed my path. As I write this, it is my hope that my students will have similar stories as their lives, like a stream, flow down their respective paths. I will remind them that like any good scientist they should take notes along the way because it goes by fast!



FaST collaboration opens career development path for students at BNL

By Kristen Dorans (2008 BNL SULI science writing intern)

Adapted from The Bulletin, vol. 62, no. 30, August, 2008.

Mentors Subramanyam Swaminathan, a BNL biologist whose recent research has resulted in finding an inhibitor for the deadly botulinum neurotoxin type A, and Ann Brown, a biology professor from Medgar Evers College in Brooklyn, are particularly interested in providing opportunities for the students they mentor to continue with research once they finish school. For example, Arshad Mahmood, a Medgar Evers graduate mentored by Swaminathan and Brown last summer, returned to work with Swaminathan as a biology associate for a year before attending medical school.

"We like to ensure that once students leave college, they still want to continue in science," Swaminathan said.

This Swaminathan/Brown program gives students from Medgar Evers, a teaching institution, a chance to join in high-level research. Then, they recruit their fellows. "The students go back and talk about their experience," Brown said. "That can influence others to want to go to a place like Brookhaven to pursue research."

The National Institute of Health Protein Structure Initiative II, New York Structural Genomix Consortium, supports Brown and

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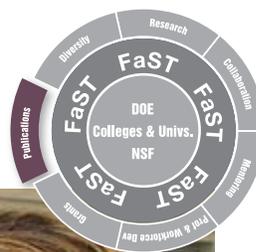
My collaboration with James Wishart at BNL gave me experience with a number of physical chemistry techniques, including thermal analysis, which I have incorporated into the physical chemistry laboratory at Brooklyn College.

—Mark Kobrak, New York

— Brooklyn College of CUNY

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Swaminathan's team. Since Brown started working with Swaminathan last year, the team has used BNL's National Synchrotron Light Source to determine three protein structures and is on its way to solving more.



CONVERSATION: Sharon Lall-Ramnarine and James Wishart

Sharon Lall-Ramnarine currently teaches in the Chemistry Department of Queensborough Community College, Bayside, NY, where she is an assistant professor who recently received tenure, in part as a result of her relationship with BNL. Additionally, she serves as the Director at Large for the New York section of the American Chemical Society and the Assistant Director for the New York Regional Alliance for Ionic Liquids. Her students have made numerous presentations at local and national scientific conferences, often winning prizes for best poster presentations. James Wishart has held the position of Chemist at BNL since 1987 and is the facility supervisor for BNL's Laser-Electron Accelerator Facility (LEAF). He also hosted the first FaST team when BNL initiated the FaST program in 2003 and has continued to host FaST teams each summer since then.

How did you and Jim begin your collaboration?

Sharon Lall-Ramnarine: In 2000, while a doctoral student at Queens College my advisor, Robert Engel, and I published a paper on our work on ionic liquids that attracted the attention of BNL scientist James Wishart, who contacted us, interested in a collaboration. Beginning in January 2001, I began working in Jim's lab at Brookhaven National Laboratory (BNL) intermittently. From the

start, this collaboration was very beneficial to me. I was able to learn new techniques from Jim that really helped me in my thesis work. At BNL, I was also able to conduct some of the characterization of the compounds I synthesized. The compounds Jim was interested in studying helped to shape the direction of my thesis project. My collaboration with Jim has been continuous since then.

How did you first introduce your community college students to BNL?

Sharon Lall-Ramnarine: Even when I was a graduate student, I brought a couple of Queens College undergraduates I was co-mentoring to BNL every time I visited. They were always excited about working at BNL, and Jim was always a great mentor to them. After graduating in 2003, I joined the faculty at Queensborough Community College (QCC) in the spring of 2004. I continued to send Jim students to continue our collaboration even when I could not visit BNL myself.

Have there been any additional ways that you and Jim have developed your collaboration to include other researchers?

Sharon Lall-Ramnarine: In 2003, Jim and I were among the founding members of the New York Regional Alliance for Ionic Liquid Studies (NYRAILS). In 2004, we co-organized the first symposium

sium of NYRAILS at BNL. The symposium attracted about 75 attendees from academia and industry including my chair and colleagues at QCC. It was very good exposure for me during my first semester as a new faculty member at QCC. In 2006 and 2007, we co-organized similar NYRAILS symposia at Queens College and Rutgers University, and in 2008 we co-organized the technical sessions on ionic liquids at the Middle Atlantic Regional Meeting of the American Chemical Society which was held at Queensborough Community College.

Jim, how has your participation in the FaST program at BNL influenced your own professional career?

James Wishart: The collaboration with Sharon has been extremely valuable to me as well because it provided important resources for my ionic liquids research, namely synthetic expertise and manpower, which would not be available at BNL any other way. Sharon has brought many highly motivated students to my lab and she has worked hard to guide them on productive research paths.

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“Being involved in the BNL FaST program has allowed me to stay current in my research field and to be involved in the most exciting and current research. I am able to bring this new knowledge to my classroom discussions and my research students. I am also able to take my research with my students to a level that I could not duplicate on my home campus. After the FaST experience many of my students decided to pursue science degrees and now consider graduate school as a career option. My BNL FaST mentor is a very valued collaborator who looks out for opportunities for me on a continuous basis.”

–Sharon Lall-Ramnarine, New York – Queensborough Community College

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James Wishart: I would add that the NYRAILS group nucleated around the group of people Sharon contacted during her thesis work to accomplish her needed experiments. In that capacity, she blazed the trail for the links that became NYRAILS.

What benefits have you and your students derived from your involvement with the FaST program at BNL?

Sharon Lall-Ramnarine: From the summer of 2005, I began taking QCC students to BNL through the FaST program as well as the CCI program. In 2005 Jim and I published a paper of our work (Wishart, J. F., S. I. Lall-Ramnarine, R. Raju, A. Scumpia, S. Bellevue, and R. Ragbir. Spectra and solvation dynamics of the electron in ionic liquids. *Radiat. Phys. Chem.* 2005 72:99-104). The relatively close proximity of BNL to QCC allows the students to continue their work on a reduced schedule throughout the year.

How has FaST impacted your students and their pursuit of their own education or a career in science?

Sharon Lall-Ramnarine: I continued to take students to BNL through the OEP programs in 2006, 2007, and 2008, mentoring an average of five students per summer and a total of twenty over the four years. Most of the students become motivated to pursue scientific careers after their BNL experience. They all went on to pursue bachelor's degrees and some are now applying to graduate school in chemistry.

This has allowed me to greatly expand and leverage my research capabilities because we can create and characterize any ionic liquid we need to further our research goals. Having a real research group full of students who work not only in the summer but also all year round has made it possible for me to compete and collaborate with academic scientists who have much greater resources at their disposal. This has opened many professional opportunities for me and allowed me to be considered a peer by top researchers in the field of ionic liquids.

And Sharon, how has your participation in the FaST program at BNL influenced your own professional career?

Sharon Lall-Ramnarine: Participating in the FaST program allowed me to take my research to a level that I could not duplicate on my home campus. It allowed Jim and me to train undergraduates to continue working on projects during the year when my teaching loads are heavy and I have very little time for research. With experienced undergraduates returning to work with us for a second and third year, we were able to spend more time applying for grants and writing up our results for publication. We currently have a paper submitted for publication (Sharon I. Lall-Ramnarine, Alejandra Castano, Marie Thomas, Gopal Subramaniam, and James F. Wishart. Synthesis, characterization and radiolytic properties of bis(oxalato) borate containing ionic liquids. *Radiat. Phys. Chem.* 2008), and in



the summer of 2007, we submitted an Laboratory Directed Research and Development proposal with other scientists at BNL to convert lignocellulosic material to biofuels. Each summer at BNL I have accepted the invitation of the OEP program coordinators to give a lecture to students in the various OEP programs. Working at BNL for so many summers has also allowed me to form collaborations with other BNL scientists. I currently have another collaborative project with A. J. Francis in the BNL Environmental Science Department.

The students presented the research they conducted with us at several local, regional and national scientific meetings.

In 2006, the QCC Chemistry Department submitted an NSF STEP proposal utilizing the successful collaborative model Jim and I had involving undergraduate researchers at a national lab, a 2-year and 4-year institution. The proposal was funded for \$2 million late in 2007. The first QCC students were funded to participate in BNL educational programs in the summer of 2008.

What outcome from FaST has affected your own professional growth?

Sharon Lall-Ramnarine: Overall this has been a mutually

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93%
of the FaST students
had a positive reaction
to FaST

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beneficial collaboration that has allowed me to grow professionally. It has allowed me to stay current in my research field, to work on exciting projects and to train my students on the most up to date equipment. Jim has been a fantastic mentor to both the students and me throughout the years. Recently, when I came up for tenure, the QCC Chemistry Department and the Office of Educational Programs at BNL were very supportive. I believe that my collaboration with Jim and participation in the FaST program played a major role in the decision of the college to award me tenure.

Jim and I have many other projects in the works and plan to submit additional papers for publication.

James Wishart: It has also been a pleasure to mentor Sharon and so many of her bright and engaging students. Through them I have been able to hone my skills as an educator, which I had not been able to use very much before in the national laboratory setting. It has also given me a perspective on science education, policy, and workforce issues that I would not have had if my nose had remained buried in just my research.



Growing Diversity through Synergy: The BNL Office of Educational Programs, FaST, and the Interdisciplinary Consortium for Research and Educational Access in Science and Engineering

Adapted from *The Bulletin*, vol. 62, no. 30, August, 2008.

Mentors Subramanyam Swaminathan, a BNL biologist whose recent research has resulted in finding an inhibitor for the deadly botulinum neurotoxin type A, and Ann Brown, a biology professor from Medgar Evers College in Brooklyn, are particularly interested in providing opportunities for the students they mentor to continue with research once they finish school. For example, Arshad Mahmood, a Medgar Evers graduate mentored by Swaminathan and Brown last summer, returned to work with Swaminathan as a biology associate for a year before attending medical school.

"We like to ensure that once students leave college, they still want to continue in science," Swaminathan said.

This Swaminathan/Brown program gives students from Medgar Evers, a teaching institution, a chance to join in high-level research. Then, they recruit their fellows. "The students go back and talk about their experience," Brown said. "That can influence others to want to go to a place like Brookhaven to pursue research."

The National Institute of Health Protein Structure Initiative II, New York Structural Genomix Consortium, supports Brown and

The formation and growth of the Interdisciplinary Consortium for Research and Educational Access in Science and Engineering (INCREASE) at BNL since the summer of 2007 exhibits the hallmarks of a program that brings together and establishes durable relations with new users for the state-of-the-art scientific instruments available at BNL. The consortium began as a vehicle for introducing the research opportunities available BNL's National Synchrotron Light Source (NSLS) to faculty members from FaST teams, Historically Black College and Universities (HBCU), and Minority Serving Institutions (MSI). Through its annual workshops hosted at BNL, INCREASE has already developed a cooperative, team-based approach to developing new avenues of research that build a community of HBCU and MSI researchers who collaborate on research projects of mutual interest at BNL, the common location for aspects of their research. The relationships between the consortiums members from HCBUs and MSIs incorporate a partnership opportunity with BNL researchers. The synergy generated by this community and its relationship to BNL offer the INCREASE members the tools to explore new avenues



of collaborative research by making the grants needed to support this research more competitive. The success of INCREASE's model for developing a new user base for advanced scientific instruments not only encourages its members at different institutions to engage each other, but also to consider BNL as well as other national laboratories as a collaborator in solving research problems together.

The INCREASE program continues to highlight BNL's own commitment to scientific productivity, diversity, and its local communities. In 2007, BNL's Office of Educational Programs (OEP) conceived and initiated a program that reached out to faculty members from BNL's FaST teams as well as faculty from Historically Black College and Universities (HBCU). The program, a collaboration composed of three BNL groups (NSLS, OEP, and the BNL Diversity Office) as well as three HBCUs, sought to develop a consortium of HBCU and MSI professors, including FaST faculty, to provide access to the NSLS for all tenured and tenure-track HBCU and MSI faculty. The annual workshops that have grown out of this initial collaboration have sought to achieve four primary objectives:

- To expose HBCU and MSI research faculty to NSLS science,
- To enhance the research capabilities of HBCU and MSI faculty,
- To create a diverse pool of well-qualified candidates in synchrotron science, and
- To assist in the development of competitive proposals for these HBCU and MSI faculty to allow them to become independent beam-

line users at the NSLS.

A product of the first annual workshop, INCREASE, strengthens existing research ties between BNL, HBCUs, and MSIs, including Hispanic Serving Institutions and Tribal Colleges, by establishing new, long-term relationships among these constituencies and BNL.

With its members acting as ambassadors, INCREASE has already begun to develop the number of professors and students introduced to synchrotron science. The consortium is designing a synchrotron curriculum that provides HBCU students with general knowledge about synchrotron science as well as hands-on experience. Eric Sheppard, Dean of the School of Engineering and Technology at Hampton University and Chairman of INCREASE, emphasized the consortium's goal to "develop the scientists of the next generation when they're undergraduates and give HBCU students exposure and an opportunity to have hands-on experience with cutting-edge research instrumentation and facilities that are not available at many of our institutions." In this way, students will gain a competitive advantage early on and be prepared to become professionals and future users and/or employees at top research facilities like BNL.

Through this INCREASE collaboration, BNL endeavors to stress the importance of tapping into communities that are not adequately represented within DOE organizations. "If we are not committed to having them [HBCUs and MSIs] as part of our community, then



we at BNL cannot be certain that we have the best talent, and in turn, are probably not offering the world the best science," said BNL Diversity Office Manager Shirley Kendall about INCREASE. While HBCUs are often the target for outreach collaborations, the NSLS-HBCU collaboration is about much more than mere outreach. INCREASE presents its members with the opportunity to form a community of researchers and share ideas for further collaborations and national laboratories. INCREASE also models how HBCUs and MSIs can find a common ground with other national laboratories to create partnerships that foster collaborative research.

Four professors have already submitted successful NSLS beam time proposals and have become full beamline users at the NSLS facility. A short-term goal of INCREASE is to enroll at least one beamline user at the NSLS from each school in the consortium. The OEP, INCREASE's HBCU and MSI faculty members, the NSLS chairman, staff and researchers have all committed themselves to make this collaborative research opportunity work. INCREASE is now developing sufficient relationships and structure to begin seeking additional sources of funding to advance the research possibi-

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50%
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presented at a
conference

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ties offered by BNL's NSLS. BNL itself plans to continue to utilize existing educational programs to bring in HBCU undergraduate students for short term visits to the site and is vigorously encouraging graduate students to take advantage of the opportunity to complete an internship at the NSLS facility through the fully-funded Master of Science in Instrumentation Fellowship program at Stony Brook University, another partnership outgrowth of the INCREASE consortium.

The NSLS-INCREASE collaboration is successfully increasing awareness about synchrotron research as well as training and enabling professors to acquire the research skills and capabilities that will enable them to expand their own scientific research at their home institutions. By capturing the brightest talent and creating a diverse user community for Light Source science at Brookhaven, we are building a pipeline of future talent at BNL as well as creating professionals and networks for the US scientific community as a whole. BNL is excited to welcome back, annually, the familiar faces of INCREASE and to meet new faculty and students from this community who are eager to experience the cutting edge research facilities and resources that BNL has to offer them.



Professor Profiles

Chronology of FaST at Brookhaven National Laboratory

2000

Department of Energy (DOE) initiates Faculty and Student Teams Program (FaST) at six DOE national laboratories.



2003

Brookhaven National Laboratory (BNL) sponsors its first FaST team from one school in New York.

Faculty Member	BNL Mentor	BNL Department	College/University
Kobrak, Mark	James Wishart	Chemistry New York	Brooklyn College of CUNY



2004

BNL sponsors 5 FaST teams (5 faculty, 10 students) from five schools in four states.

Faculty Member	BNL Mentor	BNL Department	College/University
Reginald Blake	Terry Sullivan	Environmental Sciences	New York – New York City College of Technology
Abebe Kebede	Myron Strongin	Physics	NC – North Carolina A&T State University
Mark Kobrak	James Wishart	Chemistry	New York Brooklyn College
Jyhcheng Liu	Carmen Benkovitz	Environmental Sciences	New Jersey – New Jersey City University
Elhang Shaban	D. Peter Siddons	NSLS	Louisiana – Southern U. College at Baton Rouge



2005

BNL sponsors 10 FaST teams (10 faculty, 21 students) from ten schools in seven states.

Faculty Member	BNL Mentor	BNL Department	College/University
Reginald Blake	Michael Reynolds	Environmental Sciences	NY– New York City College of Technology
Rita Hagevik	Tim Green	Environmental Sciences	NC – North Carolina A&T State University
Maureen Krause	John Dunn	Biology	New York – Hofstra University
Sharon Lall-Ramnarine	James Wishart	Chemistry	New York – Queensborough Community College
Jyhcheng Liu	Douglas Wright	Environmental Sciences	New Jersey – New Jersey City University
Sanjay Malhotra	A. J. Francis	Environmental Sciences	New Jersey – New Jersey Institute of Technology
Ray O’Neal	Helio Takai	Physics	Florida – Florida A&M University
Seydou Samake	Louis Pena	Medical	Georgia – Fort Valley State University
Elhang Shaban	D. Petere Siddons	NSLS	Louisiana – Southern U. College at Baton Rouge
Sam Subramanian	Terry Sullivan	Environmental Sciences	Alabama – Miles College

**2006**

BNL sponsors 14 teams (14 faculty, 28 students) from thirteen schools in seven states.

Faculty Member	BNL Mentor	BNL Department	College/University
Hirendra Banerjee	S. Swaminathan	Biology	North Carolina – Elizabeth City State University
Wenyi Bi	Sean McCorkle	Energy Sciences & Technology	Pennsylvania – Cheyney U. of Pennsylvania
Roy Coomans	Tim Green	Environmental Protection	NC – North Carolina A&T State University
Skeete Dereck	John Heiser	Environmental Sciences	New York – Medgar Evers College
James Hammonds	Tom Butcher	Energy Sciences & Technology	New York – City College of New York
Murty Kambhampati	Tim Green	Environmental Protection	Louisiana – Southern University at New Orleans
Sharon Lall-Ramnarine	James Wishart	Chemistry	New York – Queensborough Community College
Ray O'Neal	Helio Takai	Physics	Florida – Florida A&M University
Robert Opila	Steve Hulbert	NSLS	Delaware – University of Delaware
Suzanne Seleem	Richard Hahn	Chemistry	Ohio – Central State University
Elhang Shaban	D. Petere Siddons	NSLS	Louisiana – Southern University at Baton Rouge
Hazem Tawfik	Devinder Mahajan	Energy Sciences & Technology	New York – Farmingdale State College (SUNY)
Jiufeng Tu	Myron Strongin	Physics	New York – City College of New York
Lori Zaikowski	John Miller	Chemistry	New York – Dowling College



2007

BNL sponsors 10 teams (10 faculty, 18 students) from nine schools in five states.

Faculty Member	BNL Mentor	BNL Department	College/University
Shawn Abernathy	James Wishart	Chemistry	District of Columbia – Howard University
Kwesi Amoa	Joanna Fowler	Medical	New York – Medgar Evers College (2 teams)
Wenyi Bi	Sean McCorkle	Biology	Pennsylvania – Cheyney U. of Pennsylvania
Ann Brown	S. Swaminathan	Biology	New York – Medgar Evers College (2 teams)
Murty Kambhampati	Tim Green	Environmental Protection	Louisiana – Southern University at New Orleans
Sharon Lall-Ramnarine	James Wishart	Chemistry	New York – Queensborough Community College
Suzanne Seleem	Richard Hahn	Chemistry	Ohio – Central State University
Elhang Shaban	D. Petere Siddons	NSLS	Louisiana – Southern University at Baton Rouge
Hazem Tawfik	Devinder Mahajan	Energy Sciences & Technology	New York – Farmingdale State College
Lori Zaikowski	John Miller	Chemistry	New York – Dowling College



2008

BNL sponsors 11 teams (11 faculty, 22 students) from 11 schools in seven states.

Faculty Member	BNL Mentor	BNL Department	College/University
Thomas Abe	John Heiser	Environmental Sciences	North Dakota – Fort Berthold Community College
Shawn Abernathy	James Wishart	Chemistry	District of Columbia – Howard University
George Armstrong	Devinder Mahajan	Energy Sciences & Technology	Mississippi – Tougaloo College
Ann Brown	S. Swaminathan	Biology	New York – Medgar Evers College
Murty Kambhampati	Tim Green	Environmental Protection	Louisiana – Southern University at New Orleans
Sharon Lall-Ramnarine	James Wishart	Chemistry	New York – Queensborough Community College
Ray O'Neal	Paul O'Connor	Instrumentation Division	Florida – Florida A&M University
Varattur Reddy	David C. Grills	Chemistry	New York – Kingsborough Community College
Elhang Shaban	D. Petere Siddons	NSLS	Louisiana – Southern University at Baton Rouge
Hazem Tawfik	Devinder Mahajan	Energy Sciences & Technology	New York – Farmingdale State College
Ju Xin	Trevor Sears	Chemistry	Pennsylvania – Bloomsburg U. of Pennsylvania



2009

BNL sponsors 25 teams (25 faculty, 52 students) from 22 schools in 13 states

Faculty Member	BNL Mentor	BNL Department	College/University
George Armstrong	Devinder Mahajan	Energy Sciences & Technology	Mississippi – Tougaloo College
Jin Bakalis	John Miller	Chemistry	New York – Queensborough Community College
Ann Brown	S. Swaminathan	Biology	New York – Medgar Evers College
Florence Etop	Thomas Butcher	Energy Sciences & Technology	Virginia – Virginia State University
Gabriel Gwanmesia	Lisa Miller	NSLS	Delaware – Delaware State University
Tequila Harris	Devinder Mahajan	Energy Sciences & Technology	Georgia – Georgia Institute of Technology
Seogjoo Jang	John Miller	Chemistry	New York – Queensborough Community College
Gilbert John	Dev Chidambaram	Environmental Sciences	Oklahoma – Oklahoma State University
Widera Justyna	Charles Black	CFN	New York – Adelphi University
Murty Kambhampati	Tim Green	Environmental Protection	Louisiana – Southern University at New Orleans
Abebe Kebede	David Grills	Physics	NC – North Carolina A&T State University
Hakeem Olusseyi	Andrew Becker	U. of Washington Astronomy	Florida – Florida Institute of Technology
Ray Oneal	Paul O'Connor	Instrumentation	Florida – Florida A&M University
William Powell	Mickey Chiu	Physics	Maryland – Morgan State University
Varattur Reddy	David Grills	Chemistry	New York – Kingsborough Community College
Onarae Rice	Peter Thanos	Medical	South Carolina – Furman University
Carol Scarlett	Yannis Semertzidis	Physics	Florida – Florida A&M University
Dereje Seifu	Dario Arena	NSLS	Maryland – Morgan State University
Elhag Shaban	David Siddons	NSLS	Louisiana – Southern University at Baton Rouge
Peter Spellane	S. Swaminathan	Chemistry	New York – New York City College of Technology
Mangala Tawde	Paul Freimuth	Biology	New York – Queensborough Community College
Hazem Tawfik	Devinder Mahajan	Energy Sciences & Technology	New York – Farmingdale State University
Jiufeng Tu	Qiang Li	Physics	New York – City College of New York
Barbara Wilson	Lisa Miller	NSLS	Mississippi – Jackson State University
Zhigang Xiao	Elaine DiMasi	NSLS	Alabama – Alabama A&M University
Ju Xin	Trevor Sears	Chemistry	Pennsylvania – Bloomsburg U. of Pennsylvania

Thomas A. Abe

Instructor
 Science Department
 Fort Berthold
 Community College
 New Town, ND
 Total Years Teaching 4

Education

Minot State College
 BA 1968 Chemistry
 University of North Dakota
 BS 1976 Medicine

Positions and Employment

1998 - 2001
 Columbia University: NASA/GISS
 Post - Doctoral Fellow

1999 - 2001
 Research Assistant Professor – CCNY

2001 - 2004
 City Research Scientist –
 NYC Department of
 Environmental Protection

2001 - present
 Research Scientist – NOAA
 Cooperative Remote Sensing Science
 and Technology Center

2003 - present
 Assistant Professor of Physics –
 New York City College of Technology

2004 - present
 Visiting Research Scientist –
 Brookhaven National Laboratory

Pedagogy and Research**Classes Taught (Both Lecture and Laboratory)**

Recent Fort Berthold Community College classes: chemistry, anatomy, environmental science, ecology, physics

New Courses Developed

Field Research II (Bio 232) Tribal College University Program

Research Interests

Environmental Science, Air Quality Research, Energy and Environmental Development

Existing Institution Research Laboratory or Research Center

Name of Research Laboratory/Center Pending possible NSF MRI competitive grant

BNL Experiences**2008**

Mentor	John Hieser
Project Name	Atmospheric Trace Gas Analysis (using PFTs)
Students Participating	2

Recent Publications

Arthur J. Atkinson, Jr., and John M. Strong. 1973. Pharmacokinetic Study of a Patient with Diaphenylhydantoin Toxicity. *Clinical Pharmacology and Therapeutics* 14, no. 4, part 1: 521–527. Honorable Mention for technical assistance: Thomas A. Abe.

James Brosseau and Thomas A. Abe. 1976. Study of Diabetes on the Fort Berthold Reservation. *Public Health News*.

John M. Strong, Thomas A. Abe, Enrich L. Gibbs, and Arthur J. Atkinson, Jr. 1974. Plasma Levels of Methsuximide and N-desmethylemethsuximide During Methsuximide Therapy, *NEUROLOGY* 24, no.3: 250–255.

Recent Grants

Submitted Abe, Thomas, PI. Major Research Implementation. NSF. 2009.

Professional Enrichment**Collaborators**

Bob Pieri, Mechanical Engineer, North Dakota State University and David Gemmill, Air Quality Consultant

Synergistic Activities or Collaborations

Collaboration on the currently reviewed NSF MRI Fort Berthold Community College Air Quality Research Monitoring Project

George Armstrong

Professor

Chemistry Department

Tougaloo College

Tougaloo MS

Total Years Teaching 18

Education

Akron University, PhD

1973 Polymer Science

Atlanta University, MS

1965 Chemistry

Knoxville College, B.S

1960 Chemistry

Positions and Employment

2001–2008

Tougaloo College, Professor

1999–2001

Tevco, Inc., Research Scientist

1994–1999

Revlon Research Center, Research Manager

1982–1999

Alcoa Technical Center, Research Manager

1978–1982

LOF Technical Center, Group leader

1972–1978

Union Carbide Research Center,

Research Scientist

Pedagogy and Research**Classes Taught (Both Lecture and Laboratory)**

Organic Chemistry I & II, Organic Chemistry Lab I & II, Polymer Chemistry

New Courses Developed

Organic Chemistry I & II, Organic Chemistry Lab I & II, Polymer Chemistry

Research Interests

Polyurethane, Polymeric membrane development for enhance Proton Exchange Membrane (PEM) Fuel Cell Performance.

Existing Institution Research Laboratory or Research Center

Name of Research Laboratory/Center	Department of Homeland Security, National Transportation Security, Center of Excellence
General Description	Research on and train in transportation security
Number of Participants	Three institutions
Funding Agency/Agencies	DHS
Role	Interm Director

BNL Experiences**2004**

Mentor	Devinder Mahajan
Project Name	Catalyzed Conversion of Methanol into Higher Oxygenates; Effect of Direct Oxidation of Methanol, Ethanol, Propanol and Mixed Alcohol Feeds on the Proton Exchange Membrane (PEM) Fuel Cell Performance

Students Participating 2**Research Mentoring (Summation)**

Level	Role	Number	Outcomes of Special Interest
Undergraduate	Advisor	15	Professor gave four presentation and student gave eight poster presentation

Recent Grants

Submitted Seven grants

Professional Enrichment**Institution/Departmental Committee Memberships**

General Education Committee

Professional Memberships

ACS and NOBCChE

Collaborators

Dr. Devinder Mahajan (BNL/SBU Joint Appointment)

Reginald A. Blake

Assistant Professor, Physics
 New York City College of
 Technology, CUNY
 Brooklyn, NY
 Total Years Teaching 21

Education

City College of New York, BS
 1987 Meteorology

City College of New York, MA
 1990 Meteorology and Physical
 Oceanography

City University of New York, PhD
 1998 Hydro-Climatology and
 Water Resources

Positions and Employment

2004–present
 Visiting Research Scientist
 Brookhaven National Laboratory

2003–present
 Assistant Professor of Physics
 New York City College of Technology

2001–present
 Research Scientist
 NOAA Cooperative Remote
 Sensing Science and
 Technology Center

2001–2004
 City Research Scientist
 NYC Department of
 Environmental Protection

1999–2001
 Research Assistant Professor
 CCNY

Pedagogy and Research

Classes Taught (Both Lecture and Laboratory)

Introductory Physics Courses - both Lecture and Laboratory

New Courses Developed

1. An Introduction to the Physics of Natural Disasters
2. Natural Disasters and Construction

Research Interests

Meteorology, Climatology, Hydrology, Climate Change Impacts, Satellite and Ground-Based Remote Sensing of the Environment: hurricanes, soil moisture, vegetation, air pollution

Existing Institution Research Laboratory or Research Center

Name of Research Laboratory/Center	NOAA-CREST; NASA/Goddard Institute for Space Studies; Urban Climate Change Research Network
Funding Agency/Agencies	NOAA; NASA
Role	Research Scientist

BNL Experiences

2004

Mentor	Dr. Terry Sullivan
Project Name	Local Mercury Deposition from Coal-Fired Power Plants, Case Study: Kincaid, Illinois
Students Participating	2

2005

Mentor	Dr. Michael Reynolds
Project Name	An Inter-Comparison Study to Evaluate the Discrepancy in the Measurement of Air Temperature
Students Participating	3

2006

Mentor	Dr. Michael Reynolds
Project Name	Urban Dispersion Modeling Program
Students Participating	2

Research Mentoring (Summation)

Level	Role	Number	Outcomes of Special Interest
Undergraduate	Advisor	33	
Masters	Advisor	5	Two students went on to pursue the Ph.D. degree
	Committee Member	2	
Doctorate	Advisor	2	Pursuing the Ph.D degree
Post-Doctorate	Advisor	1	Currently working as a post-doc fellow at NOAA-CREST
	Committee Member	0	

Reginald A. Blake

Professional Enrichment

Institution/Departmental Committee Memberships

Committees: College Council, Budget, Grants, Pluralism and Diversity, Retention, Recruitment, Dean's Search, Sustainability, Curriculum, Course Coordinator, Laboratory

Professional Memberships

American Physical Society; American Meteorological Society; American Water Resources Association; American Geophysical Union

Honors and Awards

2008 - Selected to New York City Panel of Experts on Climate Change by Mayor Bloomberg

2009 - Featured in Who's Who in America.

Collaborators

Drs. William Russel; Cynthia Rosenzweig, Reza Khanbilvardi, Charles Vorosmarty; Fred Moshary; Johnny Lou

Synergistic Activities or Collaborations

Climate Change Impacts Study on NYC with Dr. Rosenzweig and NASA/GISS

Climate Change Impacts Study on Global Cities with Dr. Rosenzweig and the Urban Climate Change Research Network

Satellite Remote Sensing Applications to Hydrology, Hurricanes, and Climatology being conducted at NOAA-CREST.

Recent Grants

Blake, Reginald, PI. Research experience for undergraduates in satellite and ground-based remote sensing at NOAA-CREST. NSF. \$459,108. May 2008–May 2011.

———, Senior Internal Advisor. ADVANCE. NSF. \$250,000 per year. September 2008–August 2011.

———, Senior Research Personnel. Cyberinfrastructure training, education, advancement, and mentoring for our 21st century workforce. NSF. \$250,000 per year. September 2008–August 2010.

———, Co-PI. Environmental satellite remote sensing. NOAA. \$12,500,000.00. October 1, 2006–September 30, 2011.

———, Co-PI. Environmental satellite remote sensing. NOAA. \$12,000,000.00. January 1, 2002–September 30, 2006.

———, Co-PI and Program Director. Increasing the enrollment and success of African-American male students in science, technology, engineering, and mathematics (STEM). City University of New York. \$130,000 for one year. September 2008–August 2009.

———, Co-PI and Program Director. Increasing the enrollment and success of African-American male students in science, technology, engineering, and mathematics (STEM). City University of New York. \$130,000 for one year. September 2007–August 2008.

———, Co-PI and Program Director. Increasing the enrollment and success of African-American male students in science, technology, engineering, and mathematics (STEM). City University of New York. \$63,000 for one year. January 2007–December 2007.

———, Co-PI and Program Director. Increasing the enrollment and success of African-American male students in science, technology, engineering, and mathematics (STEM). City University of New York. \$65,000 for one year. January–December 2006.

———, Co-PI. Green Brooklyn: An interdisciplinary approach to urban environmental studies. City University of New York. \$10,000 for one year. September 2007–August 2008

———, Co-PI in Collaboration with NASA/GISS. New York City Research Institute. NASA. \$160,000. October 2006–September 2007.

———, Co-PI in Collaboration with NASA/GISS. New York City Research Institute. NASA. \$222,000. October 2005–September 2006.

———, Co-PI in Collaboration with CCNY. NOAA's Environmental Entrepreneurship Program. \$200,000 per year for four years. September 2004–August 2008.

———, PI. Institute for Higher Education Policy. NASA/NSF. \$7,600. July 2008.

———, PI. Institute for Higher Education Policy. NASA/NSF. \$10,000. July 2007.

———, Co-PI. Faculty Development Grant. City University of New York. \$10,000. September 2007–August 2008

———, Co-PI in Collaboration with Columbia University's Earth Institute. Urban design lab for sustainable development and environmental justice. Ford Foundation. \$500,000 per year for two years with a third year option. November 2005–October 2007.

———, Co-PI in Collaboration with LaGuardia Community College and, NASA/Goddard Institute for Space Studies. An improved remote sensing technique to assess the aerosol uncertainty in climate change. City University of New York. \$40,000 for one year. September 2005–August 2006.

Reginald A. Blake

Recent Publications

- Blake, Reginald A., Reza M. Khanbilvardi, and Cynthia Rosenzweig. 2000. Assessment of climate change impacts on New York City's water supply system. *Journal of the American Water Resources Association* 36(2): 279 - 292.
- Rosenzweig, C., W. Solecki, V. Gornitz, K. Jacob, D. Major, P. Kinney, R. Miller, R. Zimmerman, E. Hartig, R. Goldberg, and R. Blake. 2000. Climate change and a global city: An assessment of the metropolitan east coast region. Technical Report prepared for the U.S. National Assessment of the Potential Consequences of Climate Variability and Change. Columbia University and NASA/GISS. New York, NY.
- Sullivan, Terry M., Jay Adams, and Reginald Blake. 2006. Urban impacts of mercury emissions from coal-fired power plants. *Journal of Urban Technology* 13, no.2: 53 – 70.
- Edwards, M.A., M. Winslow, and R. Blake. 2007. Assessing Pine Barrens soil moisture regimes using synthetic aperture radar (SAR) Techniques. *Journal of IEEE, International Geoscience and Remote Sensing Symposium*.
- Gaffin, S. R., C. Rosenzweig, R. Khanbilvardi, L. Parshall, S. Mahani, H. Glickman, R. Goldberg, R. Blake, R. B. Slosberg, and D. Hillel. 2008. Variations in New York City's urban heat island strength over time and space. *Journal of Theoretical and Applied Climatology* 94, nos. 1 - 2.
- Lakhankar T., H. Ghedira, R. Khanbilvardi, and R. Blake. Relevance of land-cover variability in soil moisture retrieval from active microwave data. (Submitted to *Journal of Spatial Hydrology* – July 2008).
- Mongroo, A. and R. Blake. *Principles of Science, Laboratory Manual Volume One*. New York: The McGraw-Hill Companies, 2005.
- Gaffin, S. R., C. Rosenzweig, L. Parshall, D. Beattie, R. Berghage, R. Blake, and G., D. Braman. Energy balance modeling applied to a comparison of green and white roof cooling efficiency, green roofs in the NY metropolitan region. Research Report, Columbia University, June 2006.
- Blake, R. The science, evidence, impacts, and politics of global climate change. *Perspectives: A Journal of the Faculty and Staff*. New York City College of Technology. March 2007.

Rita Hagevik

Assistant Professor of
Science Education
Department of Theory and
Practice in Teacher Education
The University of Tennessee
Knoxville, TN
Total Years Teaching 4

Education

Meredith College, Raleigh, NC BS
1989 Biology

North Carolina State University MS
1999 Science Education

North Carolina State University PhD
2003 Science Education

North Carolina State University PhD comajor
2003 Forestry

Positions and Employment

2006–present
Univ. of TN, Asst. Prof. of Science Ed.

2004–2006
NC A&T State University,
Asst. Prof. Science Ed. in Biology Department

2003–2004
NC Partnership for Mathematics and Science,
UNC system

Pedagogy and Research

Classes Taught (Both Lecture and Laboratory)

NCA&T. Comparative Vertebrate Anatomy, Environmental Biology, Biology I (for majors), Methods in Science Education

Univ. of TN. Science in the Natural Environment, the Nature of Mathematics and Science, Theoretical Foundations in Environmental Education, Elementary Science Methods, Advanced Research in Science Education, Internship in the Middle Grade

New Courses Developed

All of these course I developed from the beginning

Research Interests

Outdoor and Environmental Education, Geographic Information Systems, Nature of Science

Existing Institution Research Laboratory or Research Center

Name of Research Laboratory/Center	Department of Homeland Security, National Transportation Security, Center of Excellence
Funding Agency/Agencies	DHS
Role	Interim Director

BNL Experiences

2005

Mentor	Timothy Green and Mark Fuhmann
Project Name	Comparative Analysis of Soil and Water Chemistry Associated with Selected Wetland Habitats in the Long Island Pine Barrens
Students Participating	2

Research Mentoring (Summation)

Level	Role	Number
Undergraduate	Advisor	75
	Advisor	6
Masters	Committee Member	28
	Advisor	2
Doctorate	Committee Member	5

Rita Hagevik

Recent Grants

Boger, D., PI; R. Hagevik, P. Powers, and A. Bugbee, co-PI. Teacher Professional Continuum, Content mentoring and its impact on middle grades mathematics and science teacher effectiveness. NSF. \$2,000,000. 2006–2010.

Clark, M., PI. R. Hagevik, G. Skoltis, H. Mills, M. Gibson, co-PIs. TENNMAPS. Math and Science Partnership, Tennessee Department of Public Instruction. \$750,000. 2007–2010.

Hagevik, R., PI. Ready for the World, Telling the story: Experiences of culturally diverse teachers. University of Tennessee College of Education, Health, & Human Sciences. \$2,708. 2008–2009.

———, PI. Cherokee National Forest, Conservation and Management of Tennessee's Environment. USFS. \$45,000. 2007–2010.

———, PI. Ready for the World, Brazil-UTK Connections: Teacher-to-Teacher. University of Tennessee College of Education, Health, & Human Sciences. \$5,000. 2007–2008.

———, and L. Woosley, PI. Freshman seminar program: Codes, caudexes, and science. University of Tennessee. \$2,500. 2007–2008.

———, PI. Comparative analysis of soil and water chemistry associated with coastal plain goods. NSF/NC-LSAMP Supplemental Award, Brookhaven National Laboratory. \$21,500. 2005.

———, PI. Faculty Development Award. NC A & T State University. \$1,500. 2005.

Radhakrishman, N., K. Schimmel, and S. Billign, PI. R. Hagevik led on Research Strand V. Interdisciplinary Scientific Environmental (ISET) Cooperative Research and Education Center. NOAA. \$12,500,000. 2006–2011.

Tang, G., PI; R. Hagevik, G. Gayle, D. Dunn, and P. Fersner, co-PI. Development of an integrated multidisciplinary GIS and remote sensing education and research training program. NASA. , \$100,000. 2005–2006.

Recent Publications

Brownstein, E., E. Allan, D. Dykstra, R. Hagevik, and W. Veal. (Submitted) Understanding and using the 2003 NSTA Science Teacher Preparation Standards. *Journal of Research in Science Teaching*.

Hagevik, R. 2008. Facilitating scientific inquiry using CITYgreen and the problem-study framework. *Meridian Middle Schools Technology Journal* 11 (1).

———, D. Hales, and J. Harrell. 2007. GIS Live and web problem solving. *Meridian Middle Schools Technology Journal* 10 (2).

———, C. Melear, E. Lunsford, K. Sadler, and C. Smith-Walters. In press. Joining the last child in the woods: An argument for environmental education in teacher preparation programs. In P. Kurtz & F. Ren (Eds.), *Scientific Inquiry and Human Well-Being*, eds. P. Kurtz & F. Ren. Amherst, New York: Prometheus Books and Beijing, China: Science and Technology Publishing House.

———, H. Stubbs, D. Whitaker. Submitted. Situated learning in environmental education: Using geospatial technologies for preservice secondary teachers. In *The Inclusion of Environmental Education in Science Teacher Education*, ed. A. Bodzin, B. Klein, and S. Weaver. Philadelphia, PA: Association of Science Teacher Educators.

Roberson, J. and R. Hagevik. 2008. Cell phones for education. *Meridian Middle Schools Technology Journal* 11 (2).

Professional Enrichment Institution/Departmental Committee Memberships

Technology, International/Intercultural, Middle Grades, Chair Nonformal science education

Professional Memberships

American Educational Research Association
American Geophysical Union

Association of Science Teacher Educators
International Organization for Science and Technology Education

National Association for Research in Science Teaching

National Association of Professors of Middle Level Education

National Center for Teaching Thinking

National Middle School Association

National Science Education Leadership Assoc.

National Science Teachers Association

North American Association of Environmental Education

Phi Beta Kappa

Tennessee Environmental Education Assoc.

The Society for Conservation Biology

Honors and Awards

Selected and appointed by the Governor of North Carolina, Michael Easley, to the NC Geographic Coordinating Council, 2005–2006.

Best Summer Research, The Relationship of Soil and Water Chemistry to the Preservation of Salamander Habitats in the Long Island Pine Barrens, Brookhaven National Laboratory, Upton, NY, August 2005.

Best Poster, selected by a peer panel, Interdisciplinary Teaching with Geospatial Technologies, NCA&T Teaching and Learning Conference, Greensboro, NC, April 2005.

National Award, Global ReLeaf Award for Engineering Green from American Forests, San Antonio, TX, 2003.

Phi Delta Kappa, Raleigh, NC, 2002.

Preparing for the Professorate, selected by a national panel, North Carolina State University, Raleigh, NC, 2001–2002.

Collaborators

College of Agriculture and Natural Resources,
College of Arts and Sciences, Geology

Synergistic Activities or Collaborations

North Carolina Center for Geographic Information Analysis, GIS Live online conference with NCDPI and other state agencies, The NC Museum of Art,

IUSFS contract to develop conservation curriculum, Environmental Education and Teacher Exchange in Brazil through the University of Parana in Curitiba, Brazil

Murty S. Kambhampati

Professor of Biology
 Natural Sciences Department
 Southern University at
 New Orleans
 New Orleans, LA
 Total Years Teaching 20

Education

Addis Ababa University, BS
 1982 Physics/Mathematics

Temple University, MA
 1986 Physics

Temple University, PhD
 1990 Physics

Positions and Employment

1998–present
 Associate Professor
 NC A&T State University
 1992–1998
 Assistant Professor
 NC A&T State University

1990–1992
 Visiting Assistant Professor
 Temple University

Pedagogy and Research**Classes Taught (Both Lecture and Laboratory)**

Introduction to Biology, General Biology, Plant Diversity, Morphology of Vascular Plants, Genetics, Plant Physiology, Principles of Ecology, Advances in Ecology, Environmental Biotechnology, Senior Seminars

New Courses Developed

Advances in Ecology and Environmental Biotechnology

Research Interests

Environmental Toxicology, Phytoremediation, and Environmental Microbiology/Biotechnology

Existing Institution Research Laboratory or Research Center

Name of Research Laboratory/Center	Scholarships for Excellence in Natural Sciences (SENS)
Funding Agency/Agencies	National Science Foundation
Role	Principal Investigator (Dr. Joe Omojola and Dr. Carl P. Johnson, Co-PIs)

BNL Experiences**2006**

Mentor Timothy Green

Project Name Environmental Health of Peconic River Headwaters: Water and Sediment Chemistry

Students Participating 2

2007

Mentor Timothy Green

Project Name Comparative Ecological Study: Pine Barren Ponds of Long Island, NY

Students Participating 2

2008

Mentor Drs. Timothy Green and Vishal Shah

Project Name Microbial Community Mapping of Long Island's Pine Barren Forest Soil

Students Participating 2

Research Mentoring (Summation)

Level	Role	Number	Outcomes of Special Interest
Undergraduate	Advisor Committee Member	~50 over 10 year period LAMP/PES MaCT/MSEIP/ SENS	Received mentoring/mentee awards at local and national levels. Students enrolled in graduate and professional schools.

Murty S. Kambhampatii

Recent Grants

- Kambhampatii, Murty S., PI. Scholarships for excellence in natural sciences. NSF. \$598,000. 2008–2012.
- , PI. Supplemental grant to PESMaCT for FaST 2007 stipends at BNL. NSF. ~\$30,000. 2008.
- , PI. Development of environmental biotechnology lab at SUNO. US Ed., \$263,000, 2005–2008.
- , PI. Supplemental grant to PESMaCT for FaST 2007 stipends at BNL. NSF. ~\$31,000. 2007.
- , Co-PI. Enhancement of biology computer laboratory at SUNO. LA-BoR. ~\$50,000. 2006–2007.
- , Co-PI. Enhancement of microbiology, molecular biology, and ecology laboratory instruction at SUNO. LA-BoR. ~\$30,000. 2006–2007.
- , Co-PI. Supplemental grant to PESMaCT to replace equipment. NSF. \$100,000. 2006.
- , PI. Supplemental grant to PESMaCT for FaST 2006 stipends at BNL. NSF. \$21,000. 2006.
- , Co-PI. Enhancement of microbiology teaching and research infrastructure. LA-BoR. \$53,497. 2003–2004.
- , Co-PI. Program for excellence in science, mathematics, and computer technology (PESMaCT). NSF. \$2,600,000. 2001–2008.
- , PI. Enhancement of laboratory instruction through technology in the department of biology at SUNO. LA-BoR. \$41,954. 2001–2002.
- Wischusen, E. Williams at LSU, Baton Rouge, PI, and Murty S Kambhampatii, Co-PI. Biomedical research infrastructure network (BRIN) multi-campus proposal. NIH: \$4,949,000; SUNO Share: ~\$600,000. 2001–2004.

Recent Publications

- Adegboye, D.S., MS Kambhampatii, L. Mims-Devezin, L. M. Hardester, and M. J. Clancy. 2004. A successful model for integrating high-technology courses for content requirements in science education. *J. Urban Edu.* 2 (1):151–158.
- Kambhampatii Murty S., H. St. Cyr, L. Stemley, and T. Green. 2007. Environmental health of Peconic River headwaters: Sediment chemistry. Battelle Press Paper A-052. ISBN 978-1-57477-159-6.
- , D. S. Adegboye, L. Mims-Devezin, R. and Cosby. 2004. Integration of technology into biology curriculum for teacher preparation at Southern University at New Orleans. *J. Urban Edu.* 2 (1):10–18.
- , Murty S., J. Omojola, A. Omar, D. Miranda, C. Singleton, A. Esmail, and A. Thibodeaux. 2004. Interdisciplinary science, mathematics, and technology course modules for Praxis II: a necessity at Southern University at New Orleans. *J. Urban Edu.* 2 (1):89–96.
- , Gregorio B. Begonia, Maria F.T. Begonia, Yolanda Bufford. 2005. Morphological and physiological responses of morning glory (*Ipomoea lacunosa* L.) grown in lead- and chelate-amended Soil. *Int. J. Environ. Res. Public Health* 2 (2):299–303.

Professional Enrichment

Institution/Departmental Committee Memberships

Southern University at New Orleans/
College of Arts and Sciences/Department
of Natural Sciences

Professional Memberships

American Chemical Society (ACS)
World Wildlife Fund (WWF)
Nature Conservancy
Beta Beta Beta Biological Honor Society
Beta Kappa Chi National
Scientific Honor Society
National Institute of Science.

Honors and Awards

2008. Minority Access, Inc., National Role Model faculty Award, Arlington, VA
Received several Chancellor's, Grantsmanship, and Dean's Awards for Excellence in Mentoring, Teaching, Service, and Grants secured for SUNO (consistently for the past several years).
2004 and 2005. Who's Who Among America's Teachers®.
2005–2006. Chancellor's Scholarship Cash Award (\$500.00)
2007–2008. Chancellor's Faculty Grantsmanship Cash Award (\$500.00)
2006–2007. The National Society of Toxicology Undergraduate Student Advisor Award 2006–07
2007–2008. Southern University System Faculty Grantsmanship Excellence Award

Collaborators

Brookhaven National Laboratory: OEP, BNL-NSLS; Dowling College, Oakdale, NY; Louisiana Universities Marine Consortium (LUMCON); Tulane University LAMP

Synergistic Activities or Collaborations

Pine Barren Forest and Wetland
Environmental and Microbial research
between SUNO, BNL, and Dowling College

Abebe Kebede

Associate Professor
Physics Department
NC A&T State University
Greensboro, NC 24711
Total Years Teaching 20

Education

Addis Ababa University BS
1982 Physics/Mathematics

Temple University MA
1986 Physics

Temple University PhD
1990 Physics

Positions and Employment

1998–present
Associate Professor, NC A&T State University

1992–1998
Assistant Professor, NC A&T State University

1990–1992
Visiting Assistant Professor, Temple University

Pedagogy and Research

Classes Taught (Both Lecture and Laboratory)

Modern Physics, Quantum Mechanics, Astrophysics, Astronomy, General Physics, Electromagnetism, Classical Mechanics, Solid State Physics, Statistical Physics

New Courses Developed

Several Space Science Courses: Introduction to Space Science, Introduction to Space and Atmospheric Physics

Research Interests

Physics of Materials and Space Science Education

Existing Institution Research Laboratory or Research Center

Name of Research Laboratory/Center	Physics of Materials Research
General Description	Material synthesis and Characterization
Number of Participants	Three students (variable)
Funding Agency/Agencies	No funding
Role	Principal Investigator

BNL Experiences

2004

Mentor Myron Strongin

Project Name Electrical characterization of ultra-thin films of gold evaporated on amorphous germanium substrates

Students Participating 2

Research Mentoring (Summation)

Level	Role	Number	Outcomes of Special Interest
Undergraduate	Committee Member	5	Several MS and PhD students locally and at other institutions
Masters	Advisor	4	Two students went on to pursue the Ph.D. degree
	Committee Member	5	

Abebe Kebede

Recent Grants

NIRT: Science and technology of self-assembled magnetic and superconducting nano-arrays. National Science Foundation. \$1,400,000. 07/15/04–07/14/08.

Capacity Building Partnership for Research and Education in Space Science. NASA. \$795,000. 01/01/04–2/15/08.

International Heliophysical Year-Africa Workshop, Addis Ababa Ethiopia. November 11–17. National Science Foundation. \$60,000. 09/07–09/08.

SCINDA2007 Workshop Addis Ababa Ethiopia, November 11–17. US Air Force. \$45,000. 09/07–09/08

Recent Publications

Stephen J. Pennycook and Dhananjay Kumar. 2008. Structural and flux-pinning properties of laser ablated YBCO thin films: effects of self-assembled CeO₂ nanodots on LaAlO₃ substrates. *Physica C Superconductivity*. 468:23, 2313–2316.

Kumar, D., Alok Gupta, M. Varela, A. Gapud, C. Cantoni, S. K. Viswanthan, A. Paige, J.T. Abiade¹, D.K. Christen¹, S.J. Pennycook, T. Haywood, and A. Kebede. 2005. Pulsed laser assisted processing and properties of multifunctional nanostructured materials. *International Conference on Computational Experimental Engineering and Sciences (ICCES–05)*.

Seifu, D., A. Kebede, F.W. Oliver, E. Hoffman, E. Hammond, C. Wynter, A. Aning, L. Takacs, I.-L. Siu, J. C. Walker, G. Tessema, MS Seehra. 2000. Evidence of ferrimagnetic ordering in FeMnO₃ produced by mechanical alloying. *Journal of Magnetism and Magnetic Materials*. 212: 178–18.

———, L. Takacs, and A. Kebede. 2006. 151Eu and 57Fe Mössbauer study of mechanically alloyed EuFeO₃. *Journal of Magnetism and Magnetic Materials*. 302, 2: 479–483.

Tessema, G. X., M. J. Skove, and A. Kebede. 2004. Structural studies and fermiology in NbSe₃ under uniaxial stress. *NHMFL Report*.

Professional Enrichment

Professional Memberships

American Physics Society. (Life Member)

Ethiopian Physical Society (Founder and Member)

African Physical Society (Founder and Member)

African Scientific and Academic Network (Moderator)

Synergistic Activities or Collaborations

Reviewer of *Physical Review Letters* and *Physical Review B* (on going)

Proposal Reviewer, National Science Foundation (on going)

Proposal Reviewer, United States Civilian Research and Development Foundation (on going)

UNC System-wide Undergraduate Research Consortium liaison (on going).

American Physical Society Committee on Minorities in Physics: Minority Speakers List. (on going)

Developed the African Scientific Network (<http://hoth.ncat.edu/~michael/asn>)

Developed the African Biotechnology Forum (the only forum in the World) (<http://hoth.ncat.edu/~michael/biotech>)

Developed the African Journal of Physics

Physics in Africa and International Affairs: Session organizer at National Society of Black Physicists and National Conference of Black Physics Student Joint Conference, March 13–17, 2002 Alabama A&M University, Huntsville AL

Physics for Development, Africa Focus session chair, American Physical Society, March 2003 Meeting, Austin Texas

Physics for Development, Africa Focus session chair, American Physical Society, March 2009 Meeting, Pittsburgh, Pennsylvania

Mark Kobrak

Associate Professor
 Chemistry Department
 Brooklyn College
 Brooklyn, NY
 Total Years Teaching 7

Education

Northwestern University
 Evanston, IL, BA
 1992 Chemistry and Integrated Science
 University of Chicago, MA
 1994 Chemistry
 University of Chicago, PhD
 1997 Chemistry

Positions and Employment

2006–present
 Associate Professor
 Brooklyn College, CUNY
 2001–2006
 Assistant Professor
 Brooklyn College, CUNY
 1999–2001
 Post-doctoral fellow
 Notre Dame University and
 Pennsylvania State University
 1998–1999
 Post-doctoral fellow
 University of Houston

Pedagogy and Research**Classes Taught (Both Lecture and Laboratory)**

General (first-year) Chemistry, Physical Chemistry, Quantum Chemistry (PhD level)

Research Interests

Physical chemical theory of quantum and classical processes in condensed phase. Current interest is in room-temperature ionic liquids.

BNL Experiences**2003**

Mentor James Wishart

Project Name Physical Studies of Room-Temperature Ionic

Students Participating 2

2004

Mentor James Wishart

Project Name Radiation Chemistry of Room-Temperature Ionic Liquids

Students Participating 2

Research Mentoring (Summation)

Level	Role	Number
Undergraduate	Advisor	9
Masters	Committee Member	1
Doctorate	Advisor	1
	Committee Member	1
Post-Doctorate	Advisor	1
	Committee Member	1

Mark Kobrak

Recent Grants

Submitted Kobrat, Mark. A simulation study of charge transport in dye-sensitized solar cells. NSF. \$461,000. Resubmission in preparation.

Awarded Kobrat, Mark PI. Petroleum Research Fund Type G. \$35,000. 9/1/2005–9/1/2007.

Recent Publications

Harper, J. B., and M. N. Kobrak. 2006. Understanding organic processes in ionic liquids: Achievements so far and challenges remaining. *Org. Chem.* 3:253.

Harrow, K., R. Eckhardt, D. Kopec, M. Kobrak, and P. Whitlock. 2007. Smarttutor: A unified approach for enhancing science education, *J. Comp. Sci.* 22:29.

Hirsch, W., and M. Kobrak. 2007. Lewis structure representation of free radicals similar to ClO. *J. Chem.* 84:1360.

Kobrak, Mark N. 2006. Characterization of the solvation dynamics of a room-temperature ionic liquid via molecular dynamics simulation. *J. Chem. Phys.* 125:064502.

———. 2008. The chemical environment of ionic liquids: Links between liquid structure, dynamics and solvation. *Chem. Phys.* 139:85.

———. 2007. A comparative study of solvation dynamics in room temperature ionic liquids. *Chem. Phys.* 127 184507.

———. 2007. Electrostatic interactions of a neutral dipolar solute with a fused salt: A new model for solvation in ionic liquids. *J. Phys. Chem. B* 111 4755.

———, and N. Sandalow. 2006. An electrostatic interpretation of structure-property relationships in ionic liquids, in *Molten Salts XIV*, ed. R. Mantz. Pennington, NJ: The Electrochemical Society.

———. 2008. The relationship between solvent polarity and molar volume in room-temperature ionic liquids. *Green Chem.* 9:80.

———, and V. Znamenskiy. 2004. Solvation dynamics of room-temperature ionic liquids: Evidence for collective solvent motion on sub-picosecond timescales. *Chem. Phys.* 395:127.

Znamenskiy, V., and M. N. Kobrak. 2004. A molecular dynamics study of polarity in room-temperature ionic liquids. *J. Phys. Chem. B* 108:1072.

Professional Enrichment

Institution/Departmental Committee Memberships

Deputy Chair, Chemistry, Brooklyn College

Deputy Executive Officer, Graduate Center

Undergraduate Advisor, Chemistry

Curriculum Committee

Safety Committee

Outcomes Assessment Committee

Green Chemistry Committee

Professional Memberships

American Chemical Society

Electrochemical Society

Collaborators

James Wishart, BNL

Sharon Lall-Ramnarine, Queensborough CC

Edward Castner, Rutgers University

Mark Maroncelli, Penn State Univ.

Sharon Lall-Ramnarine

Assistant Professor, Chemistry
Queensborough Community
College, CUNY
Bayside, NY
Total Years Teaching 7

Education

University of Guyana
BS Chemistry
1995 Chemistry (major)
Biology (minor)

Queens College, CUNY
MA Chemistry
1998 Chemistry

The Graduate Center,
City University of NY, M. Phil
2003 Chemistry

The Graduate Center,
City University of NY, PhD
2003 Analytical Chemistry

Positions and Employment

2007 Research Collaborator /
Mentor in the Faculty and Student Team (FaST)
Program, Brookhaven National Lab

2004-Present
Assistant Professor of Chemistry,
Queensborough Community College, CUNY

2003 - 2003
Adjunct Lecturer in Chemistry,
Queens College, CUNY

2001 – Present
Research Collaborator / Guest in Chemistry,
Brookhaven Nat. Lab

2001 - 2002
Graduate Assistant in Chemistry,
Queens College, CUNY

1997 – 2001
Activity Coordinator for the NSF
New York City Alliance for minority
Participation (AMP) program
Queens College, CUNY

1996 - 1997
Graduate Assistant in Chemistry,
Queens College, CUNY

Pedagogy and Research

Classes Taught (Both Lecture and Laboratory)

General Chemistry I and II lecture and laboratory (CH 151 and CH152)
Introductory College Chemistry lecture and laboratory (CH 127)
Introductory Organic Chemistry lecture and laboratory (CH 128)
Fundamentals of Chemistry lecture and laboratory (CH 120 and CH 121)
Chemistry and the Environment lecture (CH 110)
Chemistry and the Environment laboratory (CH 111)
Living in a Chemical World lecture (CH 101)
Living in a Chemical World laboratory (CH 102)

New Courses Developed

Developed Chemistry and the Environment as writing intensive.

Research Interests

Ionic Liquids: Synthesis, properties and applications; Green/sustainable chemistry

Existing Institution Research Laboratory or Research Center

Name of Research Laboratory/Center	Chemistry Faculty Research Laboratory
General Description	400 square feet of research space equipped with standard facilities including 3 fume hoods, rotary evaporators, hotplates, balances; High Vacuum Oven; High Vacuum pumps; UV-visible spectrometer; 60 MHz NMR; FT-IR; HPLC; GC-MS; Karl Fischer Titrator
Number of Participants	8-10 faculty members and 12-14 students
Role	Mentor to 2-4 students per semester on individual research projects

BNL Experiences

2005

Mentor	James Wishart
Project Name	Investigating the synthesis and physical characterization of ionic liquids
Students Participating	2

2006

Mentor	James Wishart
Project Name	Ionic Liquids: Synthesis and characterization
Students Participating	3

2007

Mentor	James Wishart
Project Name	Ionic Liquids: Synthesis, characterization and applications
Students Participating	2

Research Mentoring (Summation)

Level	Role	Number	Outcomes of Special Interest
Undergraduate	Advisor	17 at QCC (2004–present);	Numerous presentations at local and national scientific conferences. Prizes for best poster presentations.
	Committee Member	9 at QC (1999–2003)	
Masters	Committee Member	3	
Doctorate	Committee Member	1	

Sharon Lall-Ramnarine

Professional Enrichment Institution/Departmental Committee Memberships

08/07-Present, College Admissions Committee

09/07-Present, Department Personnel and Budget (P&B) committee

08/06 – 07/07 College Designee of the Academic Senate Steering Committee on the Committee on Course and Standing

09/06 – 05/08 Organizing Committee of the 2008 Middle Atlantic Regional Meeting (MARM) of the American Chemical Society (ACS) as Co-chair of the Ionic Liquid Symposium

09/06 – 05/08 QCC Organizing Committee for the NY ACS 2008 Undergraduate Research Symposium, as symposium Co-chair

Spring 2005, Fall 2006, Spring 2008
Chemistry department search committee for new tenure track faculty members

09/05 – 08/06 College Designee of the Academic Senate Steering Committee to the Committee on Bylaws

9/04 – Present Chemistry Department's Grade Grievance Committee

Professional Memberships

Member of the American Chemical Society
Member of Sigma Xi scientific research society

Honors and Awards

2007–2008. Director at Large for the NY section of the American Chemical Society

2006. Faculty Mentor award QCC Louis Stokes Alliance for Minority participation (LS–AMP) Program

2005–present. Co-Chair of the Student Affiliate Committee of the NY section American Chemical Society Annual Undergraduate Research Symposium.

2004–present. Assistant Director for the New York Regional Alliance for Ionic Liquids (NYRAILS)

Recent Grants

Submitted

Lall-Ramnarine, Sharon, Co-PI. Energy Frontier Research Center (EFRC); DOE. \$5,000,000 for 5 years. 10/1/08.

———, Co-PI. Science and Technology Center (STC). NSF. 10/15/08, Pre-proposal submitted.

———, PI. Integrated research strategies. NSF/LS–AMP. \$3,000. 9/08 to 8/09.

———, PI. Designing and evaluating biodegradable ionic liquids. PSC CUNY. \$3,700. 7/08 to 7/09.

———, Co-PI. Bioconversion of lignocellulose to ethanol and butanol facilitated by ionic liquid preprocessing. DOE. \$1,676,850. 6/2008 to 10/2012.

———, PI. Dissecting the mechanism of ionic liquid antimicrobial activity: A structure/function and genetic analysis. QCC CUNY Collaboration. \$30,000. 06/07 to 8/08.

———, PI. Applying microwave assisted organic synthetic techniques to the preparation of ionic liquid precursors and chiral carbanions. CUNY–EQUIPMENT, 50% matching funds from QCC Chemistry Department. \$6,725. 11/06.

———, PI. Investigating the biological effects of common ionic liquids on Zebra Fish. PSC-CUNY. \$3,940. 07/07–12/08.

———, PI. Investigating the biological effects of common ionic liquids; CUNY–Collaborative. \$39,940. 04/06.

———, Liaison. STEP: The Queens Borough Bridge. NSF-DUE. \$2,000,000. 09/2007–2012.

———, PI. Ionic liquids derived from biorenewable precursors: Synthesis and investigations of chiral and achiral materials; CUNY–Collaborative. \$79,075. 03/05.

———, Co-PI. Research experience for undergraduates site: Multidisciplinary undergraduate research experience on ionic liquids. NSF–EMSI \$241,767. 04/09/05–08/06.

———, PI. Syntheses of new ionic liquids. PSC–CUNY. \$8,000. 03/04.

———, Co-PI. Environmental Molecular Science Institute: New York Regional Alliance for Ionic Liquids Studies. NSF–EMSI. \$5,591,889. 03/04.

Awarded

Lall-Ramnarine, Sharon, PI. Integrated research strategies. NSF/LS–AMP. \$3,000. 9/2008–9/2009.

———, PI. Designing and evaluating biodegradable ionic liquids. PSC CUNY. \$3,700. 7/08–7/09.

———, Co-PI. Bioconversion of lignocellulose to ethanol and butanol facilitated by ionic liquid preprocessing. DOE. \$1,676,850. 6/2008–10/2012.

———, PI. Dissecting the mechanism of ionic liquid antimicrobial activity: A structure/function and genetic analysis. QCC and CUNY Collaboration. \$30,000. 06/07–8/08.

———, PI. Investigating the biological effects of common ionic liquids on zebra fish. PSC-CUNY. \$3,940. 07/07–12/08.

Sharon Lall-Ramnarine

Recent Publications

Cohen, J. I., M. Thomas, A. Rikin, S. Castro, V. Behaj, C. Massone, J. Gaillard, S. Lall, and R. Engel 2002. LIPs- Syntheses of phosphonium and ammonium liquid ionic phosphates. *Phosphorus and Sulfur* 177:2265–2266.

Engel, R., and S. Lall. 1999. α -Amino acid bearing side-chain C-P linkages. In *Amino-phosphonic and Aminophosphinic Acids*, ed. V. Kukhar and H. Hudson. London: John Wiley & Sons, Ltd., London.

———, J. I. Cohen, and S. Lall. 2002. A new category of liquid salt-liquid ionic phosphates (LIPs), *Phosphorus and Sulfur* 177:1441–1445.

———, S. Lall-Ramnarine, D. Coleman, and M. Thomas. 2007. New cations for ionic liquids, including chiral adjuncts with phosphate and sulfonylimide anions. In *Ionic liquids in Organic Synthesis Vol. 950*, ACS Symposium Series, ed. Sanjay Malhotra. Washington DC: American Chemical Society, 259.

———, V. Shevchenko, S. Lall, B. Tropp, N. Lau, and T. Strekas. 1999. Synthesis and biological activities of phosphorus-containing polycationic strings. *Phosphorus, Sulfur and Silicon* 147:83.

Lall, S., D. Mancheno, R. Casiano, S. Castro, A. Rikin, J. I. Cohen, and R. Engel 2002. LIPs- Electrochemical and spectroscopic characteristics. *Phosphorus and Sulfur* 177:2267–2268.

———, D. Mancheno, S. Castro, V. Behaj, J. I. Cohen, and R. Engel 2000. Polycations X. LIPs, A new category of room temperature ionic liquids based on polyammonium salts. *Chem. Comm.* 2413.

———, V., Behaj, D. Mancheno, R. Cassiano, M. Thomas, A. Rikin, J. Gaillard, R. Raju, A. Scumpia, S. Castro, R. Engel, and J. Cohen 2002. Polycations. 12. The synthesis of liquid ionic phosphates (LIPs) from mono- and polycationic ammonium halides. *Synthesis* 11:1530–1540.

Lall-Ramnarine, S. I. and Irina Rutenburg 2006. *Experiments in Everyday Chemistry. Laboratory Manual*. Boston: Pearson Custom Solutions. ISBN 0536167990.

———, S., D. Coleman, J. Wishart, M. Thomas, A. Ipe, S. Suarez, S. Greenbaum, and R. Engel. 2007. Synthesis and characterization of new types of ionic liquids. In *Molten Salts XIV*, eds. R. A. Mantz, P. C. Trulove, H. C. De Long, G. R. Stafford, R. Hagiwara, and D. A. Costa. The Electrochemical Society, Pennington, NJ 303.

———, Sharon I., Alejandra Castano, Marie Thomas, Gopal Subramaniam, and James F. Wishart. Manuscript in press, 2009. Synthesis, characterization and radiolytic properties of bis(oxalato)borate containing ionic liquids *Radiat. Phys. Chem.*

Thomas, Marie, Leah Rothman, Jasmine Hatcher, Pooja Agarkar, Rabindra Ramkirath, Sharon Lall-Ramnarine, and Robert Engel. Manuscript in press, 2009. Synthesis and thermo-chemical properties of stereoisomeric dihydroxy- and tetrahydroxyalkyl ammonium salts. *Synthesis*.

Wishart, J. F., S. I. Lall-Ramnarine, R. Raju, A. Scumpia, S. Bellevue, and R. Ragbir. 2005. Spectra and solvation dynamics of the electron in ionic liquids. *Radiat. Phys. Chem.* 72:99–104.

Collaborators

Collaborators within the last 48 months:

Prof. Edward Castner (Rutgers University), Prof. Robert Engel (Graduate Advisor, Queens College, City University of NY), Prof. Steven Greenbaum (Hunter College, City University of NY), Dr. A. J. Francis (Brookhaven National Laboratory), Prof. Mark Kobrak (Brooklyn College, City University of NY), Prof. Pokay Ma (Queens College, City University of NY), Prof. Catherine McEntee (Kingsborough Community College, City University of NY), Dr. Marie Thomas (Brookhaven National Laboratory), Dr. James Wishart (Brookhaven National Laboratory)

Synergistic Activities or Collaborations

2005–present. Co-Chair of the Student Affiliate Committee of the NY section American Chemical Society Annual Undergraduate Research Symposium.

2007–present. Director at Large for the NY section of the American Chemical Society.

2004–present. Assistant Director for the New York Regional Alliance for Ionic Liquids (NYRAILS).

2004–2007. Co-organizer of NYRAILS ionic liquid workshops at Brookhaven National Laboratory (April 2004); at Queens College (July 2007) and at Rutgers University, New Brunswick (October 2007)

2008. Co-organizer of ionic liquid sessions at the 40th Middle Atlantic Regional Meeting (MARM) of the ACS.

2007. Invited panel reviewer for the National Science Foundation's (NSF) Course, Curriculum, and Laboratory Improvement (CCLI) Program.

2007. Reviewer for the National Science Foundation's (NSF) Research in Undergraduate Institutions (RUI) program.

Varattur D. Reddy

Associate Professor
Department of Physical
Sciences
Kingsborough
Community College
Brooklyn, NY
Total Years Teaching 7

Education

S.V. University, India, BS
1974–1977 Chemistry, Physics,
and Mathematics

S.V. University, India, MS
1977–1979 Chemistry/Organic

Indian Institute of Technology,
Bombay, India, PhD
1986–1990, Organic/Organometallic

Positions and Employment

2008–present
Associate Professor
Kingsborough Community College

2001–2008
Assistant Professor
Kingsborough Community College

2000–2001
Research Associate and Adjunct Assistant
Professor, St. Johns University

1999–2000
Visiting Assistant Professor
Montclair State University, N.J.

1998–1999
Senior Scientist, Schering-Plough Research
Institute, Kenilworth, NJ

1996–1998
Research Associate
York College, CUNY

1994–1996
Research Associate
Hunter College, CUNY

1993–1994
Research Scientist
American Health Foundation
Valhalla, NY

1991–1993
Research Associate
Hunter College of CUNY

1990–1991
Post-doctoral Fellow
Queens College of CUNY

Pedagogy and Research**Classes Taught (Both Lecture and Laboratory)**

Organic Chemistry 1 and 2 Lecture and Labs

New Courses Developed

Wrote two lab books and introduced new lab experiments. Introduced new teaching methods.

Research Interests

Synthesis of Organic and organometallic compounds to study anticancer activity. Reduction of carbon dioxide to methanol using organometallic compounds as catalysts.

Existing Institution Research Laboratory or Research Center

Name of Research Laboratory/Center	Chemistry Research Laboratory M158
General Description	Synthesis of novel Organic and organometallic compounds
Number of Participants	3
Funding Agency/Agencies	PSC–CUNY Research Awards
Role	Principal Investigator

BNL Experiences**2008**

Mentor D. C. Grills and D. Polansky

Project Name Towards Catalytic Carbon Dioxide Reduction: Photoinduced Hydrogen Atom Transfer From Novel Ruthenium Carbonyl Clusters

Students Participating 2

Research Mentoring (Summation)

Level	Role	Number
Undergraduate	Advisor	7

Varattur D. Reddy**Recent Grants**

Reddy, V. D., PI. Reactivity of ruthenium carbonyl clusters containing chiral carbohydrate ligands. PSC-CUNY-38. 7/1/07-6/30/08.

———, PI. Synthesis and catalytic activity of chiral ruthenium hydride clusters. PSC-CUNY-37. 7/1/06-6/30/07.

———, PI. Synthesis of ruthenium carbonyl clusters containing chiral carbohydrate ligands. PSC-CUNY-36. 7/1/04-6/30/05.

———, PI. Synthesis of modified nucleoside analogues as anti-HIV agents. PSC-CUNY-34. 7/1/03-6/30/04.

———, PI. Synthesis of oxaselenonucleosides as anti-HIV agents. NSF-LSAMP. 6/1/2002-6/1/2004.

———, PI. Photo-induced hydrogen atom transfer from novel ruthenium carbonyl clusters. NSF-LSAMP, 6/2008-8/2008.

Recent Publications

Chakraborty, D., P. Mathur, I. J. Mavunkal, V. Rugmini, V. D. Reddy, and B. H. S. Thimmappa. 1989. Synthetic aspects and chemistry of some novel cluster complexes. Proc. Indian. Nat. Sci. Acad. 55:342.

Mathur, P., V. D. Reddy, and R. Bohra. 1991. Addition of methylene groups to $\text{Fe}_3(\text{CO})_9(\text{Te})_2$. J. Organomet. Chem. 40:339.

———, and V. D. Reddy. 1990. Insertion of methylene group into the Te-Te bond of $\text{Fe}_2\text{Te}_2(\text{CO})_6$. J. Organomet. Chem. 387:193.

———, and V. D. Reddy. 1990. Reduction of $\text{Fe}_2\text{Te}_2(\text{CO})_6$ and the reaction of dianion formed with metaldihalides, LMCl_2 , ($\text{L}=\text{PPh}_3$, $\text{M}=\text{Pt}$, Pd , Ni ; $\text{L}=\text{C}_5\text{H}_5$; $\text{L}=\text{Me}$, $n\text{-Bu}$, $\text{M}=\text{Sn}$). J. Organomet. Chem. 385:363.

———, D. Chakraborty, I. J. Mavunkal, V. D. Reddy, V. Rugmini, and B. H. S. Thimmappa. 1990. Role of Tellurium in Cluster Synthesis. Metalloorg. Khim. 3:7.

———, V. D. Reddy, K. Das, and U. C. Sinha. 1991. Synthesis and structural characterization of a new methylene bridged double butterfly shaped complex $[(\text{CH}_3\text{Te})\text{Fe}_2(\text{CO})_6]_2[\text{Te}-\text{CH}_2-\text{Te}]$. J. Organomet. Chem. 409:255.

Reddy, Varattur D., and R. W. Franck. 1993. Cleavage and Activation of Benzylidene Lactones with N-Bromosuccinimide. J. Org. Chem. 58:6911.

———, D. Dayal, S. C. Cosenza, M. V. R. Reddy, W. C. Pearl, Jr., and R. D. Adams. Submitted. Glycal ruthenium carbonyl clusters: Synthesis, characterization, and anticancer activity. J. Organomet. Chem.

———. 2007. A miniscale and microscale approach to experiments in organic chemistry I, 2nd ed. Hoboken, NJ: John Wiley & Sons.

———. 2005. A miniscale and microscale approach to experimental organic chemistry II. Hoboken, NJ: John Wiley & Sons.

———. 2006. Synthesis, characterization, and reactivity of a novel ruthenium carbonyl cluster containing tri-O-benzyl-D-glucal as a chiral carbohydrate ligand. J. Organomet. Chem. 691:27.

Professional Enrichment**Institution/Departmental Committee Memberships**

Deputy Chair, Chemistry, Brooklyn College

Deputy Executive Officer, Graduate Center

Undergraduate Advisor, Chemistry

Curriculum Committee

Safety Committee

Outcomes Assessment Committee

Green Chemistry Committee

Professional Memberships

American Chemical Society

Electrochemical Society

Collaborators

James Wishart, BNL

Sharon Lall-Ramnarine, Queensborough CC

Edward Castner, Rutgers University

Mark Maroncelli, Penn State Univ.

Elhag H. Shaban

Associate Professor
Electrical Engineering
Department
Southern University
Baton Rouge, LA
Total Years Teaching 17

Education

University of Khartoum BSEE
1968 Electrical Engineering

University of Khartoum MSEE
1978 Electrical Engineering

University of Florida PhD EE
1986 Electrical Engineering

Positions and Employment

1991–present
Associate professor
Southern University Baton Rouge

1988–1991
Consultant
Godak International

1987–1988
Visiting professor
University of Puerto Rico

1980–1986
Graduate student
University of Florida

1973–1979
National Council for Research
Khartoum, Sudan

1968–1972
Sudan Armed Forces
Khartoum, Sudan

Pedagogy and Research**Classes Taught (Both Lecture and Laboratory)**

Electronics (Lec & Lab), Device Physics, Circuit Analysis (Lec & Lab), digital logic, layout and fabrication of integrated circuits

New Courses Developed

HBCU consortium–BNL: Introduction to Synchrotron Science Course

Research Interests

Fluorescence Gas detectors using Gas Electron Multiplier

Existing Institution Research Laboratory or Research Center

Name of Research Laboratory/Center	Micostructure Fluorescence Gas Detectors
General Description	Gas detector Laboratory
Number of Participants	2
Funding Agency/Agencies	LA Board of Regents
Role	Principal Investigator

BNL Experiences**2006**

Mentor D. P. Siddons

Project Name Fluorescence Detector

Students Participating 2

2007

Mentor D. P. Siddons

Project Name Fluorescence Detector

Students Participating 2

2008

Mentor D. P. Siddons

Project Name Design and installation of Monochrometer at X7A Beamline at NSLS–BNL

Students Participating 2

Research Mentoring (Summation)

Level	Role	Number
Undergraduate	Advisor	2

Elhag H. Shaban

Recent Grants

Submitted Shaban, Elhag H., PI. Louisiana Board of Regent. \$100,000. 2007.

———, PI. NSLS–BNL Synchrotron Science Course. NSF HBCU–Consortium. 2008.

Awarded Shaban, Elhag H., PI. EPSCoR. Louisiana Board of Regents. \$12,000.

Recent Publications

Gray, Jamel, Derrek Anderson, and E. H. Shaban. Simulation of the electric field and potential for a micro pattern x-ray detector. Paper presented at ASEE/GSW, UNM, Albuquerque, NM, March 26–28, 2008.

Huey, Eric, M. Mason. E. H. Shaban, D. P. Siddons, and A. Kucsweski. Summer research experience for undergraduates to build an x-ray gas detector at Brookhaven National Laboratory. Paper presented at ASEE/GSW, South Padre Island, University of Pan America, TX, March 2007.

Shaban, E. H. The communication course as a requirement for undergraduate electrical engineering degree. Paper presented at ASEE/GSW, UNM, Albuquerque, NM, March 26–28, 2008.

———. Faculty and Student Team (FaST) research experience at Brookhaven National Laboratory for summer 2004. Paper presented at LS–LAMP conference, New Orleans, LA October 2004.

———, D. P. Siddons, and A. Kucsweski. 2007. Gas Electron Multiplier (GEM) enhanced Ionization Chamber. Nucl. Instr. & Methods. A.

———. Undergraduate electrical engineering curriculum in Louisiana. Paper presented at ASEE, GSW, University of Texas Pan America, March 2007.

Professional Enrichment

Institution/Departmental Committee Memberships

EE Department Council

Professional Memberships

ASEE

Collaborator

Dr. D. P. Siddons, BNL

Synergistic Activities or Collaborations

HBCU–NSLS–BNL consortium

Swaminathan Subramaniam

Professor
Chemistry Department
Division of Natural Sciences
and Mathematics
Miles College
Fairfield AL
Total Years Teaching 13

Education

B.I.T.S. Pilani, India BS and MS
1877 Chemistry

Mississippi State University
MS State, Mississippi PhD
1989 Analytical Chemistry

Positions and Employment

1997–present
Professor, Associate Professor
Assistant Professor, Miles College, Fairfield, AL

1996–2002
Visiting Faculty
Part-time faculty
Lawson State Community College,
Birmingham, AL

1998
Visiting Faculty, Samford University,
Birmingham, AL

1995
Visiting Faculty, Birmingham Southern College,
Birmingham, AL

1977–1982
Senior Chemist
Sarabhai Research Center
New Drugs Research Division, Vadhodara,
India

1989
Jacksonville State University
Dept. of Chemistry, Jacksonville, AL

1990–1994
ENSOTECH, Sun Valley,
CA, Quality Control Supervisor
of Analytical Laboratories

Pedagogy and Research

Classes Taught (Both Lecture and Laboratory)

Organic Chemistry I, II, General Chemistry I, II, Analytical Chemistry, Quantitative Analysis, Environmental Analysis, and Biochemistry

New Courses Developed

Advanced Instrumentation Analysis

Research Interests

Environmental analysis of Pharmaceuticals and priority pollutants in treated water, Nano-technology using single walled and multi walled carbon nanotubes, Pharmaceuticals in domestic waste effluents by GC/MS and HPLC. Nucleotide synthesis using synthetic organic chemistry techniques.

Existing Institution Research Laboratory or Research Center

Name of Research Laboratory/Center	Advanced instrumentation lab in the division of Natural Sciences and Mathematics, Miles College, Fairfield, Alabama
General Description	HBCU–UP funded research
Number of Participants	3
Funding Agency/Agencies	NSF
Role	Research Director

BNL Experiences

2005

Mentor Dr. Terry Sullivan

Project Name Profiling of mercury near a coal burning power plant in Texas

Students Participating 3

Research Mentoring (Summation)

Level	Role	Number	
Undergraduate	Advisor	5	Abstract presentations and poster presentations
	Committee Member	4	

Recent Grants

Subramaniam, Swaminathan, PI. DOD instrumentation award. \$169,000.

———, PI. EPA award. \$55,000.

———, PI. RSEC visiting faculty research awards (two different institutions). \$50,000.

Recent Publications

Kalasinsky, V. F., S. Subramaniam, C. F. Su, and R. L. Cook. 2000. Raman, infrared, and microwave spectra and conformational preferences of meso-bisoxirane. Special Issue. *Journal of Molecular Structure* 550: 521–530.

Subramaniam, S., M. J. Lance, C. J. Rawn, B. C. Chakoumakos, and A. J. Rondinone. 2005. Raman spectroscopic studies on structure I and structure II trimethylene oxide hydrate. *Canadian Journal of Physics* 83:941–949.

Zheng, Chao, Swaminathan Subramaniam, Victor F. Kalasinsky, and James R. Doring. 2006. Raman and infrared studies supported by ab initio calculations for the determination of conformational stability, silyl rotational barrier and structural parameters of cyclohexyl silane. *Journal of Molecular Structure* 785 (1–3):143–159.

Swaminathan Subramaniam

Professional Enrichment

Institution/Departmental Committee Memberships

Proposal committee, teacher education committee, Research director for HBCU–UP program

Professional Memberships

ACS, Alabama Academy of Sciences, Cahaba River Society

Collaborators

University of Alabama at Birmingham and Tuscaloosa, University of Minnesota, University of Tennessee

Synergistic Activities or Collaborations

2008. Worked as a Co-PI and Subcontractor for EPA grant EP-C-07-014 on Identification and Treatment of Emerging Contaminants in Wet Weather Flows, in collaboration with the Environmental Institute, Department of Civil, Construction, and Environmental Engineering, The University of Alabama, Tuscaloosa, AL. PI: Dr. Robert Pitt, Professor, The University of Alabama, Tuscaloosa, AL.

2007. Recipient of Department of Defense Research grant to purchase of FT–NMR equipment in the Division of Natural Sciences and Mathematics at Miles College. Grant amount \$ 169,000.

2007. Participated in the NSF sponsored CWCS workshop on Material Science and Nanotechnology for Chemists, conducted by the department of chemistry at Beloit College, Beloit, Wis. Advanced training in the nanotechnology and material science laboratory for undergraduate curriculum.

2007. HBCU–UP summer research at the Materials Engineering Department, University of Alabama at Birmingham, Birmingham, Alabama. Research Mentor: Dr. D. Dean, Professor. "Fictionalization of Single Walled Carbon Nanotubes and its epoxy polymer composites."

2006. Recipient of University of Minnesota–RSEC research fellowship in the department of chemistry. Research work was carried out on the analysis of pharmaceuticals in wastewater effluents using SPE/GC/MS and monitored the effect of chlorination on specific pharmaceuticals. Research Mentor: Dr. Kris McNeill.

2005. Participated in FaST (Faculty and Student Team) research at the Brookhaven National Laboratory, Upton, NY. Research work was carried out in the Environmental Technology Division with Dr. Terry Sullivan, on mercury profiling near a coal burning utility plant at Monticello, Texas.

2005. Book review: *The Physical Universe*, Krauskopf and Beiser, McGraw Hill, 11th Edition.

2003 and 2004. Recipient of UT–RSEC research fellowship (An NSF sponsored program at the Department of Chemistry, University of Tennessee, Knoxville, TN). Research work was done at the Oak Ridge National Laboratory, Organic and Biological Mass Spectrometry department. Carried out research on separation and quantification of PAHs and porphyrins by HPLC/APPI/MS and HPLC/APCI/MS.

2003–present. Chemistry faculty coordinator for the Health Careers Opportunity Program (HCOP), at Miles College. Conducted chemistry workshops and relevant laboratories for both college and high school students during summer.

1997. Book Reviewer for McGraw Hill, *Organic Chemistry*, Francis Carey, 4th Edition Book Reviewer for McGraw Hill, *General Chemistry*, Wang, 5th Edition.

1997–2003. High School Science Day chief judge for posters from chemistry department, Chemistry curriculum development at Miles College and Lawson State College. Greening of Miles College through tree planting campaign. Incorporated micro scale laboratory techniques in organic chemistry curriculum.

Research on "Cahaba River" of Birmingham for pollutants using standard analytical methods.

1998–2003. Organizer of science shows in elementary and middle schools of Greater Birmingham

1999–present. Faculty advisor for Science Club at Miles College and Science News Letter publication

1998, 1999. Served on K–12 Teachers Education Program and participated in chemistry workshops.

2002. Oak Ridge Institute of Science Education, (ORISE), Oak Ridge National Laboratory (ORNL); summer research at High Flux Isotope Reactor (HFIR). Research on neutron scattering studies on clathrate hydrates, and vibrational analysis of clathrate hydrates.

2001. Research training award in Materials Science and Engineering, Summer program, Department of Materials Engineering, University of Alabama, Tuscaloosa, Alabama

1999–2004. Miles College: Summer Science Faculty Grant, HBCU–UP program-support for summer research students and faculty stipend.

1997, 1998, 1999. Mentored three high school students in Alabama Project SEED, and ACS sponsored program.

Hazem Tawfik

Distinguished Professor
and Director
Mechanical Engineering Techno-
logy Department, Institute
for Research and Technology
Transfer (IRTT), School of
Engineering Technologies
State University of New York
College of Technology at
Farmingdale
Farmingdale, NY
Total Years Teaching 25

Education

Alexandria University BS
1968 Mechanical Engineering

Alexandria University MS
1974 Mechanical Engineering

University of Waterloo PhD
1980 Mechanical Engineering

University of Waterloo Post Doctor
1980 Chemical Engineering

Positions and Employment

1996–present
Distinguished Professor and Director of the
Institute for Research and Technology Transfer
(IRTT), SUNY Farmingdale.

1990–1996
Professor of Mech. Eng. Tech. Department,
SUNY Farmingdale.

1986–1990
Coordinator of Mech. Eng. Tech. Department,
SUNY Farmingdale.

1983–1986
Associate Professor of Mech. Eng. Tech., SUNY
Farmingdale

1982–1983
Atomic Energy of Canada, Mississauga, Ontario,
Canada

1980–1982
Research Scientist, Ontario Hydro Research,
Toronto, Canada

Pedagogy and Research

Classes Taught (Both Lecture and Laboratory)

Robotics and Automation, CAD/CAM/CAE, Statistical Quality Control, Thermal Sciences

New Courses Developed

Hydrogen Fuel Cells, Hydrogen Electrolyzers, Bio-fuels

Research Interests

Bipolar plates development for Hydrogen and Methanol fuel cells

Existing Institution Research Laboratory or Research Center

Name of Research Laboratory/Center	Institute for Research and Technology Transfer (IRTT)
General Description	Its main mission is to support the regional economic growth through the development and transfer of new technologies to industry and enriches the educational experience of students.
Number of Participants	10 Faculty, Visiting Professors, Engineers and Technologists 12 undergraduate and graduate students
Funding Agency/Agencies	Farmingdale Foundation Advanced Energy Research and Technology Center (AERTC) SBU–Empire State Development
Role	Director

BNL Experiences

2006

Mentor Dr. Devinder Mahajan

Project Name Thermal and Humidity Management in Hydrogen and Methanol Fuel Cells

Students Participating 2

2007

Mentor Dr. Devinder Mahajan

Project Name Investigation of the effects of flow patterns, temperature and humidity inside the fuel cell

Students Participating 2

2008

Mentor Dr. Devinder Mahajan

Project Name Investigation of nonprecious catalyst, heat generation and humidity requirement for hydrogen and methanol fuel cells

Students Participating 2

Research Mentoring (Summation)

Level	Role	Number	
Undergraduate	Advisor	60	
Masters	Advisor	2	Bachelor Engineering Technology Degree Senior Students
Doctorate	Advisor	1	Engineering Master Degree Project
	Committee Member	1	Bipolar Plates Research and Development for Hydrogen and Methanol Fuel Cells
Post-Doctorate	Advisor	2	Bipolar Plates Research and Development for Hydrogen and Methanol Fuel Cells

Hazem Tawfik

Recent Grants

Submitted Tawfik, Hazem, PI. Advanced Energy Research and Technology Center. Stony Brook University. \$25,000. Awarded.

———, PI, and Ralph James, Associate Laboratory Director. BNL Research Project. \$15,000.

———, PI. Empire State Development. \$150,000. Awarded.

———, PI. Environmental Protection Agency. \$180,000. 2006. No award.

———, PI. Environmental Protection Agency. \$1,500,000 Pending.

———, PI. Farmingdale Foundation. \$30,000. Awarded.

———, PI. Long Island Power Authority. \$550,000. 2008. Pending.

———, PI. New York State Energy Research Development Agency. \$200,000.

———, PI. Route 110 Redevelopment Incorporation. \$85,000. Completed.

———, PI. Topic 2a. Department of Energy. \$1,500,000. 2008. Pending

———, PI. Topic 4a. Department of Energy. \$1,200,000. 2006. No award.

———, PI. Topic 7a. Department of Energy. \$1,200,000. 2006. No award.

———, PI. Department of Energy. The development of two PEM Fuel Cells (30 kW each) for Farmingdale's campus peak load shaving utilizing the hydrogen by-product of the 300 kW Molten Carbonate fuel cell manufactured by Fuel Cell Energy Inc. \$6,000,000. Pending.

Awarded ———, PI. Advanced Energy Research and Technology Center. Stony Brook University. \$25,000.

———, PI, and Ralph James, Associate Laboratory Director. BNL Research Project. \$15,000.

———, PI. Empire State Development. \$150,000

———, PI. Farmingdale Foundation. \$30,000.

Tawfik, Hazem, PI. Route 110 Redevelopment Incorporation. \$85,000.

Professional Enrichment

Institution/Departmental Committee Memberships

Institution/Departmental Committee Memberships

Chair of the Continued Appointment Committee in the Mechanical Engineering Technology Department, Farmingdale State College

Adjunct Professor in the Materials Science and Engineering Department, Stony Brook University

Applied Research Committee Member, Advanced Energy Research and Technology Center (AERTC), Stony Brook University

Honors and Awards

ASME Education Award

SUNY Research Foundation, Research Award

University of Waterloo Graduate Students Award

Professional Memberships

American Society of Mechanical Engineers (ASME)

American Society of Quality Control (ASQC)

Society of Manufacturing Engineers (SME)

Professional Engineer (P.E.) of the State of New York

Professional Engineer (P. Eng.) of the Province of Ontario, Canada

Certified Manufacturing Engineer (C.Mfg.E.)

Collaborators

Devinder Mahajan (Biofuels, Brookhaven National Laboratory & Stony Brook University), Yugoslav Adzic (Catalyst, Chemistry, Brookhaven National Laboratory), Fred Janckle (Senior Manager, Fuel Cell Energy Inc.)

Synergistic Activities or Collaborations

Hydrogen and Methanol Fuel Cell and Hydrogen Generator Research and Development

Hazem Tawfik

Recent Publications

Arif, R., Y. Ryu, A. Filios, H. Chu, H. Tawfik, and K Shahrabi. Humidity control system for proton exchange membrane (PEM) hydrogen fuel cell. Paper presented at The American Society for Engineering Education (ASEE) conference, May, 2008.

Crowly, Raja, and Hazem Tawfik. Performance comparison between graphite and metallic bipolar plates in direct methanol fuel cell. Paper presented at ASME Fifth International Conference on Fuel Cell Science, Engineering and Technology, Brooklyn, NY, June 18–21, 2007.

Hung, Yue, Hazem Tawfik, and Devinder Mahajan, " Characterization studies on PEM metallic bipolar plates and membrane electrode assembly after one thousand hours of operation. Paper presented at IEEE conference, May, 2008.

———, K. M. El-Khatib, and H. Tawfik. 2005. Corrosion resistant, lightweight metallic bipolar plates for PEM fuel cells. *Journal of Applied Electrochemistry* 35, no. 5:445–447.

———, H. Tawfik, and D. Mahajan. 2008. Durability and characterization studies of PEM fuel cell's coated aluminum bipolar plates and membrane electrode assembly. *Journal of Power Sources*.

———, K. M. El-Khatib, and Hazem Tawfik. 2006. Testing and evaluation of aluminum coated bipolar plates of PEM fuel cells operating at 70° C. *Journal of Power Sources* 163, 1:509–513.

I-Khatib, K. M., H. A. El-Abd, and Hazem Tawfik. Corrosion and contact resistance measurements of different bipolar plate material for polymer electrolyte membrane fuel cells. Paper presented at Tenth International Conference on Energy and Environment, Luxor, Egypt, March 11–15, 2007.

Tawfik, H., Y. Hung, and D. Mahajan. Characterization studies on PEM metallic bipolar plates and membrane electrode assembly. Paper presented at ASME Fifth International Conference on Fuel Cell Science, Engineering and Technology, Brooklyn, NY, June 18–21, 2007.

———, Y. Hung, and D. Mahajan. 2007. Metal bipolar plates for PEM fuel cell—A review. *Journal of Power Sources* 163:755–767.

———, Y. Hung, and D. Mahajan. 2006. Metallic bipolar plates for PEM fuel cells—A review. *Journal of Power Sources*.

———, K. El-Khatib, Y. Hung, and D. Mahajan. 2007. Effects of bipolar plate material and impurities in reactant gases on PEM fuel cell performance. *The Clean Fuels from Biomass and Waste Special Issue, Industrial & Engineering Chemistry Research*.

———, K. El-Khatib, Y. Hung, and D. Mahajan. 2006. Effects of bipolar plate materials and impurities in reactant gases on the power output of PEM fuel cells. *Journal of American Chemical Society*.

———, C. Rubenstein, N. Blackburn, and D. Mahajan. Renewable energy economic analysis, with case study: on Farmingdale wind farm using RETScreen software. Presented at the Long Island Science and Technology (LISAT) 2006 IEEE Conference, Farmingdale State University of New York, May 5, 2006.

Tawfik, L., H. Tawfik, and K. Shahrabi. The effect of computer utilization for problem solving by technology students on pedagogy. Paper presented at IJMA–NAIT conference in Nashville, TN, October 2008.

Yeol, Joe W., Y. Ryu, H. Tawfik, and D. Mahajan. Temperature, humidity and performance analysis of PEM fuel cells in a control loop. Paper presented at ASME Fifth International Conference on Fuel Cell Science, Engineering and Technology, Brooklyn, NY, June 18–21, 2007.

Jiufeng Tu

Associate Professor
 Physics Department
 The City College of New York
 New York, NY
 Total Years Teaching 5

Education

Harvard University, MA BA, MA
 1993 Physics

Cornell University, NY MS
 1995 Physics

Cornell University, NY PhD
 2000 Physics

Positions and Employment

2008–present
 Associate Professor
 The City College of New York

2003–2007
 Assistant Professor
 The City College of New York

2000–2003
 Research Associate
 Brookhaven National Laboratory

Pedagogy and Research**Classes Taught (Both Lecture and Laboratory)**

PHYS 353 & 354 (Electromagnetism), PHY S207 & 208 (Introduction Physics)

Research Interests

Optical Spectroscopy

Existing Institution Research Laboratory or Research Center

Name of Research Laboratory/Center	CREST
General Description	CREST: CENTER FOR EXPLOITATION OF NANOSTRUCTURES IN SENSORS AND ENERGY SYSTEMS (CENSES)
Number of Participants	~ 20 faculty
Funding Agency/Agencies	NSF
Role	Project leader

BNL Experiences**2006**

Mentor Myron Strongin

Project Name Nucleation properties of materials deposited onto carbon nanotubes at low temperatures

Students Participating 2

Research Mentoring (Summation)

Level	Role	Number
Undergraduate	Advisor	4
Doctorate	Advisor	3
	Committee Member	8

Jiufeng Tu

Recent Grants

Sarachik, M.P., PI, and J. J. Tu, co-PI. Spectroscopic and local magnetic measurements in high-spin molecular magnets. NSF. \$480,000. 01/15/2005 – 01/15/2009 (extended to 01/15/2011).

Tu, Jiufeng J., PI. Crystal growth and spectroscopic studies of low dimensional electron systems. DOE/BNL. \$168,889. 02/01/2007–02/01/2012.

———, PI, et al. Utilizing computer technology in an introductory physics course with a diverse student body. Hewlett Packard. \$118,430. 06/01/2007–06/01/2009.

———, PI, and M. C. Tamargo, co-PI. Infrared studies of CdMgTe as the material of choice for room temperature gamma-ray detectors. NSF/DNDO. \$401,821, 09/01/2007–08/31/2010.

Recent Publications

Dordevic, S. V., C. C. Homes, J. J. Tu, T. Valla, M. Strongin, P. D. Johnson, G. D. Gu, and D. N. Basov. 2005. Extracting the electron-boson spectral function $\alpha^2F(\omega)$ from infrared and photoemission data using inverse theory. *Phys. Rev. B* 71:104529.

Hwang, J., T. Timusk, A. V. Puchkov, N. L. Wang, G. D. Gu, C. C. Homes, J. J. Tu, and H. Eisaki. 2004. Marginal Fermi liquid analysis of 300 K reflectance of $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$. *Phys. Rev. B* 69:094520.

Schachinger, E., J. J. Tu, and J. P. Carbotte. 2003. Angle-resolved photoemission spectroscopy and optical renormalizations: Phonons or spin fluctuations. *Phys. Rev. B* 67:214508.

Schmadel, D. C., G. S. Jenkins, J. J. Tu, G. D. Gu, Hiroshi Kontani, and H. D. Drew. 2007. Infrared hall conductivity in optimally doped $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$: Drude behavior examined by experiment and fluctuation-exchange-model calculations. *Phys. Rev. B* 75:140506 R.

Tu J. J., G. L. Carr, V. Perebeinos, C. C. Homes, M. Strongin, P. B. Allen, W. N. Kang, Eun-Mi Choi, Hyeong-Jin Kim, and Sung-Ik Lee. 2001. Optical properties of c-axis oriented superconducting MgB_2 films. *Phys. Rev.* 87:277001.

———, C. C. Homes, and M. Strongin. 2003. Optical properties of ultra-thin Films: Evidence for a dielectric anomaly at the insulator to metal transition. *Phys. Rev.* 90:017402.

———, C. C. Homes, G. D. Gu, D. N. Basov, and M. Strongin. 2002. Optical studies of charge dynamics in the optimally doped $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ single crystals. *Phys. Rev. B* 66:144514.

———, and A. J. Sievers. 1999. Total number density of raman-active two level systems in fluorite mixed crystals and the law of mass action. *Phys. Rev.* 83:4077.

Professional Enrichment

Professional Memberships

American Physical Society

Collaborators

Philip B. Allen (Stony Brook University), Jules P. Carbotte (McMaster), G. Larry Carr (NSLS, BNL), Genda Gu (BNL), Christopher C. Homes (BNL), Peter D. Johnson (BNL), Laszlo Mihaly (Stony Brook University), Myriam P. Sarachik (City College), Thomas Timusk (McMaster), and X.X. Xi (Penn State).

Ju Xin

Associate Professor of Physics
 Physics & Engineering
 Technology Department
 Bloomsburg University of
 Pennsylvania
 Bloomsburg, PA
 Total Years Teaching 14

Education

Shanxi University BS
 1982 Laser Physics
 Marquette University MS
 2001 Computer Science
 Stockholm University PhD
 1995 Physics

Positions and Employment

2005–present
 Associate Professor
 Bloomsburg University
 2001–2005
 Assistant Professor
 Bloomsburg University
 1999–2001
 Research Associate
 Marquette University
 1997–1999
 Staff Scientist
 University of Arizona
 1995–1996
 Post-doc Research Associate
 Arizona State University
 1990–1995
 PhD candidate & T.A.
 Stockholm University

Pedagogy and Research

Classes Taught (Both Lecture and Laboratory)

Optics, Thermodynamics & Statistics, Electrodynamics, Energy, Basic Physical Science, Principles of Physical Science, Science of Light & Color, etc.

New Courses Developed

Science of Light and Color

Research Interests

Laser spectroscopy of transient species of astronomical, atmospheric, and combustion importance

BNL Experiences

2008

Mentor Trevor Sears

Project Name Frequency modulated laser absorption spectroscopy of singlet CH₂ in the near infrared region

Students Participating 2

Recent Publications

Fan, Haiyan, Ionela Ionescu, Ju Xin, and Scott A. Reid. 2004. Polarization quantum beat spectroscopy of HCF($\tilde{A}1A//$) II. 19F and 1H hyperfine structure and Zeeman effect. *Journal of Chemical Physics* 121 (18):8869–8873.

———, I. Ionescu, C. Annesley, J. Cummins, M. Bowers, J. Xin, and S. A. Reid. 2004. On the Renner-Teller effect and barriers to linearity and dissociation in HCF($\tilde{A}1A//$). *J. Phys. Chem. A*, 108:3732–3738.

Ionescu, I., H. Fan, C. Annesley, J. Xin, and S. A. Reid. 2004. Vibrational mode selectivity in hyperfine interactions: Polarization quantum beat spectroscopy of HCF($\tilde{A}1A//$). *Journal of Chemical Physics* 120 (3): 1164–1167.

Sheridan, P. M., Ju Xin, L. M. Ziurys, S. A. Beaton, S. K. Kermode, and J. M. Brown. 2002. The pure rotational spectrum of NaC in its X $4\Sigma^-$ state: Observation and interpretation. *Journal of Chemical Physics* 116:5544.

Xin, Ju, Ionela Ionescu, Haiyan Fan, and Scott A. Reid. 2004. Coherent laser spectroscopy of transient molecules and free radicals. *Recent Res. Devel. Chem. Physics* 5.

———, I. Ionescu, D. Kuffel, and S. A. Reid. 2003. On the energy dependence of the Zeeman and hyperfine parameters in the A₂⁺ state of OH and OD. *Chemical Physics* 291 (1):61–72.

———, Haiyan Fan, Ionela Ionescu, Chris Annesley, and Scott A. Reid. 2003.

Fluorescence excitation spectroscopy of the system of jet-cooled NH₂ in the region 2900–4300 Å. *J. Mol. Spectrosc.* 219 (1):37–44.

———, and Scott A. Reid. 2002. Zeeman quantum-beat spectroscopy of NO₂, Eigenstate-resolved Landé g-factors near dissociation threshold. *Journal of Chemical Physics* 116 (2):525–531.

Professional Enrichment

Professional Memberships

American Physical Society, Association of American Physics Teachers

Collaborators

Trevor Sears, BNL, Scott Reid, Marquette University

Lori Zaikowski

Professor of Chemistry,
Chemistry/Physics
Department Chair
Chemistry and Physics
Department
Dowling College
Oakdale NY
Total Years Teaching 18

Education

Stony Brook University BS
1986 Biological Sciences

Stony Brook University MS
1991 Chemistry

Stony Brook University PhD
1996 Chemistry

Positions and Employment

1992–present
Instructor through Full Professor
Dowling College

1987–1991
Grades 5–12 Science/Math Teacher,
schools in Sachem S.D.,
Copiague, and Guatemala

Pedagogy and Research**Classes Taught (Both Lecture and Laboratory)**

Undergraduate: Organic Chem I and II Lect. and Lab (every semester), Environmental Chemistry, Astrochemistry, Instrumental Analysis, Biochemistry, Science and the Concept of Evolution, Science of Natural Systems, Soil Chemistry, Senior Seminar on Environmental Studies, Senior Seminar on Science, Technology and Values. Graduate: Environmental Chemistry, Astrochemistry, Ethics and Values in Science, Advanced Organic Chemistry Reactions, Advanced Organic Chemistry Mechanisms, Seminar in Science and Math Education.

New Courses Developed

Environmental Chemistry, Astrochemistry, Soil Chemistry, Senior Seminar on Environmental Studies, Senior Seminar on Science, Technology and Values, Advanced Organic Chemistry Reactions, Advanced Organic Chemistry Mechanisms, Brownfields to Greenfields: Environmental Remediation, Chemical Evolution, Inorganic Chemistry, Ethics and Values in Science, Long Island Estuaries, Environmental Investigations and Operations, Co-op Internships in Chemistry, Earth Science, and Natural Science, Honors Project in Chemistry, Special Topics in Chemistry, Earth Science, and Natural Science.

Research Interests

1. Electron Transfer Research at BNL: The two major areas are "Energetics of Electron Transfer" and "Molecular Wires"
2. Chemistry in Action Research Program

Existing Institution Research Laboratory or Research Center

Name of Research Laboratory/Center	Chemistry Research Laboratory
General Description	Undergraduate research lab
Number of Participants	None yet; installation to begin in January 2009. Expected completion date of August 2009.
Funding Agency/Agencies	Dowling College
Role	Plans: equipment and facility. Budget: estimates, requests, purchase orders. Execution: oversee installation.

BNL Experiences**2006**

Mentor	John R. Miller
Project Name	Energetics of Charge Separation
Students Participating	5

2007

Mentor	John R. Miller
Project Name	Electron Transfer in Oligofluorene Molecular Wires
Students Participating	3

2008

Mentor	John R. Miller
Project Name	Titrations of Reduced Oligofluorenes with strong electron acceptors
Students Participating	1

Research Mentoring (Summation)

Level	Role	Number
Undergraduate	Advisor	~30

Numerous presentations at national and local meetings and to governmental entities, peer-reviewed publications.

Lori Zaikowski

Recent Grants

Submitted I don't keep track of the ones that were not funded. I was PI on two submissions (and Co-PI on a third submission) to NSF a few years ago to establish an Undergraduate Research Center. The requested funding was about \$2.7 million. There have been several others to private corporations (Honda, Toyota, etc.) and governmental entities (two requests for earmarks), mostly revolving around enhancing integration of research and teaching and acquiring instrumentation. I am PI on a pending grant proposal to NSF for Phase II of the Robert Noyce Program at Dowling (\$500,000 over 4 years).

Awarded Miller, J. PI, and L. Zaikowski (Faculty Advisor). Department of Energy funding for Dowling Noyce Scholar Juan Alicea in SULI Internship program at Brookhaven National Laboratory and Co-op Internship Program through Dowling College. \$7,000. Fall 2005.

Zaikowski, L. (Primary Coordinator and Mentor), S. R. Seidel (Co-coordinator), and P. Lichtman (Mentor). American Chemical Society Project SEED. Dowling College approved as an ACS Project SEED Institution effective April 2007. \$5,000. 2007.

———, PI. Idle Hour Flyfisher's Association Fellowship. Secured annual donation to support one student per year on a Research Fellowship to work in the Chemistry in Action research program. \$4,300. 1999–present.

———, et al. New AA and GC/MS instruments for teaching and research funded by Dowling College through science department budgets and LRPDC research and travel funds pooled over two years among science faculty. Coordinated pooling of funds and negotiated discounts from Varian. \$125,000 MSRP; \$105,000 actual cost to Dowling. 2001–2003.

———, PI, John Miller (BNL Chemistry Department, Thermal and Photoreactions Group), Juan Alicea and Kate Dorst (Dowling students), and Brian Albert, Steven Bohlman, and Alex Yang (HS students). NSF. \$16,500. June 2006.

———, PI, John Miller (BNL Chemistry Department, Thermal and Photoreactions Group), Elicia Selvaggio (Dowling Noyce Scholar), Brian Albert (Columbia University student), and two HS students. Research on effects of polarity on charge separation in molecules and wires. NSF. \$17,000. Summer 2007.

———, PI, S. Monteferrante, and J. Craven. Robert Noyce Scholarship Program for Future Math and Science Teachers in High Need Schools. NSF. \$499,764. Sept. 2003–Sept. 2009.

———, PI. NSF Supplemental funding for Noyce master teaching fellows. \$99,000. September 2008–August 2012.

———, PI. NSF Supplemental funding for Dowling Noyce Scholars Juan Alicea and Paul Guzzardo to conduct research and develop educational modules in the Pre-Service Teacher Program and the SULI Program at Brookhaven National Laboratory. \$9,000. Summer 2005.

———, PI. NSF Supplemental Funding for Dowling Noyce Scholar Paul Guzzardo to conduct research and develop educational modules in the Pre-Service Teacher Program at Brookhaven National Laboratory. NSF. \$4,500. Summer 2004.

———, PI, and J. M. Friedrich. Symposia and books on Chemical Evolution I and II. \$39,100. (Partial funding awarded: ~\$10,000). March 2007 and April 2008.

Lori Zaikowski

Recent Publications

Zaikowski, L. and Friedrich, J. M., eds. 2008. Chemical evolution across space and time: From the big bang to prebiotic chemistry. American Chemical Society Books #981. New York: Oxford University Press.

———, and P. Lichtman. 2007. Environmental research puts science into action. *The Science Teacher* 74 (4):47–51.

———, R. T. Wilkens, and K. Fisher. 2008. Science and the concept of evolution: From the big bang to origins and evolution of life. *Evolution Education and Outreach* 1 (1):65–73.

———, P. Lichtman, and D. Quarless. 200. Scientific discovery for all: Keys to developing and sustaining a successful research program. *The Science Teacher* 74 (3):28–33.

———, K. T. McDonnell, R. F. Rockwell, and F. Rispoli. 2008. Spatial and temporal variations in water quality in South Shore Estuary tributaries: Carmans, Patchogue, and Swan Rivers. *Estuaries and Coasts* 31 (1):85–100.

———, S. R. Seidel, and J. M. Friedrich. 2008. Spectroscopy and the cosmos: Applications in the chemical sciences. In Zaikowski, L. and J. M. Friedrich J. M., eds. *Chemical Evolution across Space and Time*. New York: Oxford University Press.

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Professional Enrichment

Institution/Departmental Committee Memberships

Current: Chair of the Chemistry and Physics Dept since 1995, Natural Sciences and Mathematics Faculty Development and Curriculum Committee since inception, Established/oversee Early College Program in Chemistry, Founder/Director of Chemistry in Action Research Program.

Honors and Awards

Elected to Board of Directors of American Chemical Society New York Section (2009 term)

Appointed to NSF Project Advisory Board (Chemistry representative) for development of NSF-funded website on “Understanding Science” at U.C. Berkeley. (2006–present)

Appointed Member of American Institute of Biological Sciences Education Committee (2004–present)

Research Hero Award for mentorship of minority research students at Uniondale H.S. (2004)

Honored by South Country School District Superintendent of K–12 Curriculum for mentorship of Bellport H.S. research students. (2001)

Professional Memberships

American Chemical Society, AAAS, NY Academy of Sciences, American Institute of Biological Sciences, National Science Teachers Association

Collaborators

John Miller (BNL), Jon Friedrich (Fordham Univ.), S.R. Seidel (Dowling College), Paul Lichtman (Uniondale H.S.)

Synergistic Activities or Collaborations

2006–present. National Council for Science and the Environment Encyclopedia of Earth: Topic Editor for Environmental Chemistry.

2008–present. Appointed Chair of the Governmental Affairs Committee, American Chemical Society New York Section.

2006–2008. American Chemical Society Division of Chemical Education National Conference Programming: Symposium Organizer.

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